ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section
EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230*, *Fort Wainwright, Alaska*
Page 1 of 1
Date: *26 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other
Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,143 m* Easting: *424,245 m*
Top of Hole Elevation: *137.8 m*

Hole Number, Field: *AP-17* Permanent: *AP-7932*
Driller: *Bill Tester*
Inspector: *Steve Henslee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater: *4.75 m AD*
Depth Drilled: *7.5 m*
Total Depth: *8.1 m*

Hammer Weight: *136 kg*
Split Spoon I.D: *63.5 mm*
Size and Type of Bit: *203.2 mm Rock Bit*
Type of Equipment: *Acker Soil Max*
Type of Samples: *Grab and Drive*

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
	1	Nbn		Grab	GM	Silty GRAVEL with Sand				19.1	0.5		Brown, frozen, subrounded gravel, fine sand, test boring located in roadway, fill
1													
	2		F4	42 50 52 30	ML	Sandy SILT	8	40	52	50.8	0.4	17	Brown, frozen, fine sand, nonplastic (NP) fines, wood fibers in auger cuttings, fill
2													
3	3		F2	3 4 3 4	SM	Silty SAND with Gravel	24	33	44	38.1	0.9	16	Brown to dark gray, moist, fine sand, NP fines, wood fragments, sticks and glass present in sample, fill
4													
	4a			1 2 6 7	ML	SILT					0.4		Gray and black, moist, NP fines, metal debris observed in auger cuttings, fill
5	4b		PFS		GP	Poorly graded GRAVEL with Sand	49	47	4	38.1		10	Gray, moist, subrounded gravel, fine and coarse sand
6	5			3 2 3 6	SW	Well-graded SAND with Gravel				19.1	0.5		Gray, wet, subrounded gravel, medium to coarse sand
7													
8	6			4 8 11 13	SP	Poorly graded SAND with Gravel				31.8	0.4		Gray, wet, subrounded gravel, medium to coarse sand
9													Bottom of Hole 8.1 m Elevation 129.7 m Groundwater Encountered After Drilling: at depth 4.75 m PID = (Hot) Photo Ionization Detector
10													

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Hole Number: *AP-7932*

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	Drilling Agency: ☒ Alaska District ☐ Other	Elevation Datum: ☒ MSL ☐ other
	Location: Northing: 1,209,121 m Easting: 424,181 m	Top of Hole Elevation: 137.7 m
Hole Number, Field: AP-18; Permanent: AP-7933	Driller: Bill Tester	Inspector: Steve Hensles
Type of Hole: ☐ other; ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: 4.72 m WD; Depth Drilled: 7.5 m	Total Depth: 8.1 m
Hammer Weight: 136 kg; Split Spoon I.D: 63.5 mm	Size and Type of Bit: 203.2 mm Rock Bit; Type of Equipment: Acker Soil Max	Type of Samples: Grab and Drive

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0–1	1	Nbn		Grab	ML	Gravelly SILT with Sand				6.4	0.4		Brown, frozen to moist, subrounded gravel, fine to coarse sand, nonplastic (NP) fines, possibly fill
1–2	2			4 4 5 4	SP	Poorly graded SAND					0.2		Brown, moist, fine to medium sand, NP fines
3	3		NFS	2 3 10 11	SP	Poorly graded SAND with Gravel	35	63	2	50.8	0.3	2	Brown, moist, subrounded gravel, fine sand, NP fines
4–5	4			6 7 16 14	GP-GM	Poorly graded GRAVEL with Silt and Sand				19.1	0.3		Mottled brown, moist, subrounded gravel, medium to coarse sand, NP fines
6	5			2 2 3 5	SP	Poorly graded SAND				12.7	0.2		1.2 m of heaving sand Gray, wet, fine to coarse sand
7–8	6			15 16 13 10	SP	Poorly graded SAND with Gravel and Cobbles				88.9	0.3		Gray, wet, subrounded gravel and cobbles, fine to coarse sand
8–10													Bottom of Hole 8.1 m Elevation 129.6 m Groundwater Encountered While Drilling: at depth 4.72 m PID = (Hot) Photo Ionization Detector

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Soils and Geology Section

EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230*, *Fort Wainwright, Alaska*
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Date: *26 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other
Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,153 m* Easting: *423,815 m*
Top of Hole Elevation: *137.7 m*

Hole Number, Field: *AP-19* Permanent: *AP-7934*
Driller: *Bill Tester*
Inspector: *Steve Hensiee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater: *4.85 m WD*
Depth Drilled: *7.5 m*
Total Depth: *8.1 m*

Hammer Weight: *136 kg*
Split Spoon I.D: *63.5 mm*
Size and Type of Bit: *203.2 mm Rock Bit*
Type of Equipment: *Acker Soil Max*
Type of Samples: *Grab and Drive*

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0–0.6	1	Nbn		Grab	ML	SILT with Sand				6.4	0.4		Dark brown, frozen to moist, fine sand, nonplastic (NP) fines, possibly fill
1.35–1.95	2		S2	3 3 5 3	SM	Silty SAND with Gravel	24	42	34	38.1	0.3	13	Brown, moist, fine sand, NP fines, trace organics (roots), possibly fill
2.85–3.45	3		NFS	5 4 5 4	SP	Poorly graded SAND with Gravel	39	57	4	50.8	0.4	3	Brown, moist, subrounded gravel, fine sand
4.35–4.95	4			NR	SP	Poorly graded SAND					0.2		Brown, wet, medium sand
5.85–6.45	5			2 4 3 4	SP	Poorly graded SAND				9.7	0.3		Gray, wet, medium sand
7.35–7.95	6			6 7 8 9	SP	Poorly graded SAND with Gravel				50.8	0.3		Gray, wet, subrounded gravel, fine to coarse sand

Bottom of Hole 8.1 m
Elevation 129.6 m
Groundwater Encountered While Drilling: at depth 4.85 m
PID = (Hot) Photo Ionization Detector

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Hole Number: *AP-7934*

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Date: 27 Jan 2001

Drilling Agency: ☒ Alaska District ☐ Other
Elevation Datum: ☒ MSL ☐ other

Location: Northing: 1,209,006 m Easting: 423,909 m
Top of Hole Elevation: 137.4 m

Hole Number, Field: AP-20 Permanent: AP-7935
Driller: Bill Tester
Inspector: Steve Henslee

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater: 5.24 m WD
Depth Drilled: 7.6 m
Total Depth: 8.2 m

Hammer Weight: 136 kg
Split Spoon I.D: 63.5 mm
Size and Type of Bit: 203.2 mm Rock Bit
Type of Equipment: Acker Soil Max
Type of Samples: Grab and Drive

Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
1	Nbn		Grab	ML	SILT					1.8		Brown, frozen, coarse sand, nonplastic (NP) fines, fill
2		F4	3 4 4 4	ML	SILT		6	94	12.7	2.1	34	Brown, moist, NP fines, sticks and organics present, fill
3		F4	3 3 3 4	ML	Sandy SILT		50	50		2.5	22	Brown, moist, fine sand, NP fines, possibly fill
4			1 2 3 3	ML	Sandy SILT					0.6		Dark gray, wet, fine sand, NP fines, organics present in sample
5			2 2 5 4	SM	Silty SAND					9.0		Gray, wet, fine to medium sand, NP fines
6			7 7 13 13	SP	Poorly graded SAND				38.1	2.8		1.2 m of heaving sand; Gray, wet, subrounded gravel, fine to coarse sand

Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bottom of Hole 8.2 m
Elevation 129.2 m
Groundwater Encountered While Drilling: at depth 5.24 m
PID = (Hot) Photo Ionization Detector

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Location: Northing: 1,209,046 m; Easting: 423,852 m		Top of Hole Elevation: 137.1 m
Hole Number, Field: AP-21	Permanent: AP-7936	
Driller: Bill Tester	Inspector: Steve Henslee	
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: 4.88 m WD	Depth Drilled: 7.5 m / Total Depth: 8.1 m
Hammer Weight: 136 kg	Split Spoon I.D.: 63.5 mm	Size and Type of Bit: 203.2 mm Rock Bit
Type of Equipment: Acker Soil Max	Type of Samples: Grab and Drive	

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0	1	Nbn		Grab	ML	SILT with Sand					6.8		Brown, frozen, medium to coarse sand, nonplastic (NP) fines, possibly fill
1–2	2			2 3 3 2	ML	Sandy SILT					3.2		Brown, moist, fine to medium sand, NP fines, possibly fill
3	3		F4	2 3 4 3	ML	SILT		7	93		2.4	38	Brown, moist, fine sand, NP fines
4–5	4		F4	2 1 2 1	ML	SILT		10	90		2.9	40	Gray, wet, fine sand, low plastic fines
6	5			3 4 4 4	SP	Poorly graded SAND					3.4		Gray, wet, fine to medium sand
7–8	6			3 6 4 5	SP	Poorly graded SAND					1.1		2 m of heaving sand Gray, wet, fine to medium sand

Bottom of Hole 8.1 m
Elevation 129.0 m
Groundwater Encountered While Drilling: at depth 4.88 m
PID = (Hot) Photo Ionization Detector

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Hole Number: AP-7936

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Date:	*27 Jan 2001*
Drilling Agency:	☒ Alaska District ☐ Other
Elevation Datum:	☒ MSL ☐ other
Location:	Northing: *1,209,145 m* Easting: *423,735 m*
Top of Hole Elevation:	*137.8 m*
Hole Number, Field:	*AP-22*
Permanent:	*AP-7937*
Driller:	*Bill Tester*
Inspector:	*Steve Henslee*
Type of Hole:	☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater:	*4.63 m WD*
Depth Drilled:	*7.5 m*
Total Depth:	*8.1 m*
Hammer Weight:	*136 kg*
Split Spoon I.D:	*63.5 mm*
Size and Type of Bit:	*203.2 mm Rock Bit*
Type of Equipment:	*Acker Soil Max*
Type of Samples:	*Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
		1	Nbn		Grab	ML	SILT with Sand				6.4	2.6		Brown, frozen, coarse sand, nonplastic (NP) fines, possible fill
		2		F2	3 2 2 2	SM	Silty SAND	9	56	35	38.1	1.4	10	Brown, moist, fine sand, possibly sand
		3		NFS	2 2 2 3	SP-SM	Poorly graded SAND with Silt		88	12	12.7	1.8	7	Brown, moist, fine sand, NP fines
		4			6 6 5 4	SP	Poorly graded SAND with Gravel				12.7	1.8		Brown, moist, subrounded gravel, medium to coarse sand
		5			2 3 4 8	SP	Poorly graded SAND with Gravel				19.1	7.8		0.9 m of heaving sand Brown, wet, fine subrounded gravel, fine to coarse sand
		6			7 6 7 5	GP	Poorly graded GRAVEL with Sand				19.1	1.7		Gray, wet, subrounded gravel, fine to coarse sand, NP fines

Depth scale (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bottom of Hole 8.1 m
Elevation 129.7 m
Groundwater Encountered While Drilling: at depth 4.63 m
PID = (Hot) Photo Ionization Detector

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Project: *FAMILY HOUSING UPGRADE - FTW230*, *Fort Wainwright, Alaska*

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Date: *28 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,208,990 m* Easting: *423,967 m*

Top of Hole Elevation: *136.7 m*

Hole Number, Field: *AP-23* Permanent: *AP-7938*

Driller: *Bill Tester*

Inspector: *Steve Hanslee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *3.89 m AD*

Depth Drilled: *7.5 m*

Total Depth: *8.1 m*

Hammer Weight: *136 kg*

Split Spoon I.D: *63.5 mm*

Size and Type of Bit: *203.2 mm Rock Bit*

Type of Equipment: *Acker Soil Max*

Type of Samples: *Grab and Drive*

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0	1	Nbn		Grab	ML	SILT					0.4		Brown, frozen to moist, nonplastic (NP) fines, fill
	2		F2	8 10 9 7	SM	Silty SAND	8	48	44	38.1	0.7	18	Brown, moist, fine sand, NP fines, fill
3	3			2 2 3 4	WOOD	Wood Debris					1.2		Moist, wood debis, little to no recovery, reinserted spoon and drove an additional 460 mm, fill
	3a			2 2 2 2	ML	SILT							Black, moist, slightly plastic fines, 30% wood by volume, fill
	4		F2	1 4 3 2	SM	Silty SAND	1	77	22	12.7	0.6		Gray, wet, fine sand, NP fines
6	5			3 8 6 9	SP	Poorly graded SAND				12.7	0.4		0.3 m of heaving soil. Gray, wet, subrounded gravel, fine to coarse sand
	6			8 9 10 18	SP	Poorly graded SAND with Gravel				12.7	0.4		0.9 m of heaving sand. Gray, wet, subrounded gravel, fine to coarse sand

Bottom of Hole 8.1 m
Elevation 128.6 m
Groundwater Encountered After Drilling: at depth 3.89 m
PID = (Hot) Photo Ionization Detector

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7938*

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Project: *FAMILY HOUSING UPGRADE - FTW230* *Fort Wainwright, Alaska*	Page 1 of 1	Date: *28 Jan 2001*
Drilling Agency: ☒ Alaska District ☐ Other	Elevation Datum: ☒ MSL ☐ other	
Location: Northing: *1,209,023 m* Easting: *423,763 m*	Top of Hole Elevation: *137.2 m*	
Hole Number, Field: *AP-24* Permanent: *AP-7939*	Driller: *Bill Tester*	Inspector: *Steve Henslee*
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: *4.33 m WD*	Depth Drilled: *7.5 m* Total Depth: *8.1 m*
Hammer Weight: *136 kg* Split Spoon I.D.: *63.5 mm*	Size and Type of Bit: *203.2 mm Rock Bit* Type of Equipment: *Acker Soil Max*	Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
		1	Nbn		Grab	GP	Poorly graded GRAVEL with Sand				19.1	0.4		Drilled through 76 mm of A.C. pavement Brown, frozen, subrounded gravel, fine to coarse sand
1		2	Nbn	F4	23 29 17 10	ML	SILT with Sand		21	79		0.3	2	Brown, frozen, fine sand, NP fines, possibly fill
2														
3		3		F4	2 1 3 4	ML	SILT with Sand		18	82		0.3	40	Brown, moist, fine sand, NP fines, possibly fill
						SP	Poorly graded SAND							Brown, moist, fine sand
4		4			2 2 3 4	SP	Poorly graded SAND				6.4	0.4		Brown and gray, wet, fine to medium sand
5														
6		5			4 5 4 4	SP	Poorly graded SAND				16.0	0.4		0.9 m of heaving sand Gray, wet, fine to medium sand
7		6			5 5 5 7	SP	Poorly graded SAND				12.7	0.4		Gray, wet, subrounded gravel, fine to coarse sand
8														Bottom of Hole 8.1 m Elevation 129.1 m Groundwater Encountered While Drilling: at depth 4.33 m PID = (Hot) Photo Ionization Detector
9														
10														

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Fort Wainwright, Alaska

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Date: *28 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,080 m* Easting: *423,751 m*

Top of Hole Elevation: *137.4 m*

Hole Number, Field: *AP-25* Permanent: *AP-7940*

Driller: *Bill Tester*

Inspector: *Steve Hensloe*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *4.69 m WD*

Depth Drilled: *15.1 m*

Total Depth: *15.7 m*

Hammer Weight: *136 kg*

Split Spoon I.D: *63.5 mm*

Size and Type of Bit: *203.2 mm Rock Bit*

Type of Equipment: *Acker Soil Max*

Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
		1	Nbn		Grab	ML	SILT					0.2		Brown, frozen, nonplastic (NP) fines, possibly fill
						SM	Silty SAND							Brown, moist, fine to medium sand, NP fines, possibly fill
1														
		2		NFS	2 2 2 2	SP-SM	Poorly graded SAND with Silt and Gravel	28	60	12	38.1	0.3	18	Brown, moist, fine sand
2														
3		3		S2	2 2 2 3	SM	Silty SAND with Gravel	20	53	27	25.4	0.3	9	Brown, moist, fine sand
4														
		4			4 6 6 5	SP	Poorly graded SAND				12.7	0.3		Brown, moist, fine to medium sand
5														
6		5			3 3 8 5	SP	Poorly graded SAND				25.4	0.4		Gray, wet, fine to medium sand
7														
		6			5 9 9 7	SP	Poorly graded SAND with Gravel				31.8	0.6		0.5 m of heaving sand Gray, wet, subrounded gravel, medium to coarse sand
8														
9		7			4 8 13 17	SP	Poorly graded SAND with Gravel				25.4	0.7		1.8 m of heaving sand Gray, wet, subrounded gravel, medium to coarse sand
10														

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7940*

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Fort Wainwright, Alaska

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Date: *28 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,080 m* Easting: *423,751 m*

Top of Hole Elevation: *137.4 m*

Hole Number, Field: *AP-25* Permanent: *AP-7940*

Driller: *Bill Tester*

Inspector: *Steve Henslee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *4.69 m WD*

Depth Drilled: *15.1 m*

Total Depth: *15.7 m*

Hammer Weight: *136 kg*

Split Spoon I.D: *63.5 mm*

Size and Type of Bit: *203.2 mm Rock Bit*

Type of Equipment: *Acker Soil Max*

Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
11														
12		8			5 5 10 10	SP	Poorly graded SAND with Gravel				38.1	0.6		Gray, wet, subrounded gravel, fine to coarse sand
13														
14														
15		9			20 28 35 38	SP	Poorly graded SAND with Gravel				25.4	0.6		1.2 m of heaving sand Gray, wet, subrounded gravel, fine to medium sand
16														Bottom of Hole 15.7 m Elevation 121.7 m Groundwater Encountered While Drilling: at depth 4.69 m PID = (Hot) Photo Ionization Detector
17														
18														
19														
20														

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7940*

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Project: FAMILY HOUSING UPGRADE - FTW230, Fort Wainwright, Alaska		Page 1 of 2 / Date: 29 Jan 2001
Drilling Agency: ☒ Alaska District ☐ Other		Elevation Datum: ☒ MSL ☐ other
Location: Northing: 1,209,102 m Easting: 423,835 m		Top of Hole Elevation: 137.7 m
Hole Number, Field: AP-26 Permanent: AP-7941	Driller: Bill Tester	Inspector: Steve Henslee
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: 4.33 m WD	Depth Drilled: 15.1 m / Total Depth: 15.7 m
Hammer Weight: 136 kg	Split Spoon I.D.: 63.5 mm	Size and Type of Bit: 203.2 mm Rock Bit
Type of Equipment: Acker Soil Max	Type of Samples: Grab and Drive	

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
		1	Nbn		Grab	GM	Silty GRAVEL with Sand				12.7	0.7		Brown, frozen to moist, subrounded gravel, fine sand, NP fines, possible fill
1 2		2			4 3 5 7	SP	Poorly graded SAND					0.5		Brown, moist, medium sand
3		3		NFS	3 5 6 7	SP-SM	Poorly graded SAND with Silt and Gravel	38	56	6	38.1	0.5	3	Brown, moist, subrounded gravel, fine sand
4 5		4			7 10 9 8	SP	Poorly graded SAND with Gravel				19.1	0.4		Brown, wet, subrounded gravel, fine to coarse sand
6 7		5			5 6 6 5	SP	Poorly graded SAND with Gravel				19.1			0.3 m of heaving sand Brown, wet, subrounded gravel, fine to coarse sand
8		6			8 5 6 6	SP	Poorly graded SAND with Gravel				19.1			1 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
9 10		7			4 4 7 11	SP	Poorly graded SAND with Gravel				31.8			1.2 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand

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EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230* *Fort Wainwright, Alaska*		Page 2 of 2	Date: 29 Jan 2001
Drilling Agency: ☒ Alaska District ☐ Other		Elevation Datum: ☒ MSL ☐ other	
Location: Northing: *1,209,102 m* Easting: *423,835 m*		Top of Hole Elevation: *137.7 m*	
Hole Number, Field: *AP-26*	Permanent: *AP-7941*	Driller: *Bill Tester*	Inspector: *Steve Henslee*
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: *4.33 m WD*	Depth Drilled: *15.1 m*	Total Depth: *15.7 m*
Hammer Weight: *136 kg*	Split Spoon I.D: *63.5 mm*	Size and Type of Bit: *203.2 mm Rock Bit*	Type of Equipment: *Acker Soil Max*
Type of Samples: *Grab and Drive*			

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
11														
12		8			6 8 10 9	SP	Poorly graded SAND with Gravel				19.1			0.6 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
13														
14														
15		9			8 11 9 15	SP	Poorly graded SAND with Gravel				25.4			0.6 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
16														Bottom of Hole 15.7 m Elevation 122.1 m Groundwater Encountered While Drilling: at depth 4.33 m PID = (Hot) Photo Ionization Detector
17														
18														
19														
20														

EXPLORATION LOG FTW230.GPJ GEO_LOG.GDT 3/12/01

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EXPLORATION LOG

Project:	FAMILY HOUSING UPGRADE - FTW230, Fort Wainwright, Alaska
Page	1 of 1
Date:	29 Jan 2001
Drilling Agency:	[X] Alaska District ☐ Other
Elevation Datum:	[X] MSL ☐ other
Location:	Northing: 1,208,979 m; Easting: 423,762 m
Top of Hole Elevation:	137.0 m
Hole Number, Field:	AP-27
Permanent:	AP-7942
Driller:	Bill Tester
Inspector:	Steve Henslee
Type of Hole:	☐ other ☐ Test Pit [X] Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater:	4.26 m AD
Depth Drilled:	7.6 m
Total Depth:	8.2 m
Hammer Weight:	136 kg
Split Spoon I.D:	63.5 mm
Size and Type of Bit:	203.2 mm Rock Bit
Type of Equipment:	Acker Soil Max
Type of Samples:	Grab and Drive

Depth (m)	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0	1	Nbn			ML	SILT					0.8		Brown, frozen, nonplastic (NP) fines, possible fill
1	2		PFS	5 6 6 4	SM	Silty SAND		80	20	12.7	0.0	6	Brown, moist, fine sand
3	3		NFS	2 2 2 1	SM	Silty SAND		87	13		0.3	6	Brown, moist, fine sand
4	4			13 14 7 7	SP	Poorly graded SAND with Gravel				38.1	-0.2		0.3 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
6	5			6 7 5 7	SP	Poorly graded SAND with Gravel				31.8	0.2		Gray, wet, subrounded gravel, fine to coarse sand
7.5	6			10 8 4 3	SP	Poorly graded SAND with Gravel				31.8	0.5		1.2 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand

Bottom of Hole 8.2 m
Elevation 128.8 m
Groundwater Encountered After Drilling: at depth 4.26 m
PID = (Hot) Photo Ionization Detector

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Project: FAMILY HOUSING UPGRADE - FTW230
Hole Number: AP-7942

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Fort Wainwright, Alaska

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Date: *30 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,001 m* Easting: *423,851 m*

Top of Hole Elevation: *137.2 m*

Hole Number, Field: *AP-28* Permanent: *AP-7943*

Driller: *Bill Tester*

Inspector: *Steve Henslee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *4.72 m WD*

Depth Drilled: *14.9 m*

Total Depth: *15.5 m*

Hammer Weight: *136 kg*

Split Spoon I.D: *63.5 mm*

Size and Type of Bit: *203.2 mm Rock Bit*

Type of Equipment: *Acker Soil Max*

Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
		1	Nbn		Grab	ML	SILT					1.6		Brown, frozen, nonplastic fines (NP), possibly fill
1		2		F4	3 3 3 3	ML	SILT with Sand		26	74		0.9	16	Brown, moist, fine sand, NP fines, possibly fill
2														
3		3		S2	3 3 5 5	SM	Silty SAND		87	13		1.6	6	Brown, moist, fine sand
4		4			4 4 3 2	SP	Poorly graded SAND with Gravel							Brown, wet, fine to medium sand
5														
6		5			3 3 6 8	SP	Poorly graded SAND with Gravel				19.1			0.6 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
7		6			4 6 20 40	SP	Poorly graded SAND with Gravel				38.1			0.6 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
8														
9		7			21 25 25 21	SP	Poorly graded SAND with Gravel				44.5			1.2 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
10														

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7943*

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EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230*
Fort Wainwright, Alaska

Page 2 of 2
Date: *30 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other
Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,001 m* Easting: *423,851 m*
Top of Hole Elevation: *137.2 m*

Hole Number, Field: *AP-28* Permanent: *AP-7943*
Driller: *Bill Tester*
Inspector: *Steve Henslee*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater: *4.72 m WD*
Depth Drilled: *14.9 m*
Total Depth: *15.5 m*

Hammer Weight: *136 kg*
Split Spoon I.D: *63.5 mm*
Size and Type of Bit: *203.2 mm Rock Bit*
Type of Equipment: *Acker Soil Max*
Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
11														
12		8			10 11 13 8	SP	Poorly graded SAND				15.2	0.7		1.1 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
13														
14														
15		9			9 7 9 14	SP	Poorly graded SAND				12.7	1.1		0.6 m of heaving sand Gray, wet, fine subrounded gravel, fine to coarse sand
16														Bottom of Hole 15.5 m Elevation 121.6 m Groundwater Encountered While Drilling: at depth 4.72 m PID = (Hot) Photo Ionization Detector
17														
18														
19														
20														

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Project: *FAMILY HOUSING UPGRADE - FTW230*
Hole Number: *AP-7943*

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EXPLORATION LOG

Project: FAMILY HOUSING UPGRADE - FTW230 Fort Wainwright, Alaska		Page 1 of 2 / Date: 30 Jan 2001
Drilling Agency: ☒ Alaska District ☐ Other		Elevation Datum: ☒ MSL ☐ other
Location: Northing: 1,209,161 m Easting: 423,834 m		Top of Hole Elevation: 137.6 m
Hole Number, Field: AP-29 / Permanent: AP-7944	Driller: Bill Tester	Inspector: Steve Henslee
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: 5.00 m WD	Depth Drilled: 15.1 m / Total Depth: 15.7 m
Hammer Weight: 136 kg / Split Spoon I.D.: 63.5 mm	Size and Type of Bit: 203.2 mm Rock Bit / Type of Equipment: Acker Soil Max	Type of Samples: Grab and Drive

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0		1	Nbn		Grab	ML	SILT					1.9		Brown, frozen, nonplastic (NP) fines, possibly fill
1.5		2		F4	3 3 3 3	ML	SILT		7	93		0.9	31	Brown, moist, fine sand, possibly fill
3		3		NFS	8 8 11 8	GP	Poorly graded GRAVEL with Sand	51	45	4	38.1	1.4	2	Brown, moist, subrounded gravel, fine and coarse sand
4.5		4			5 5 3 3	SP	Poorly graded SAND				9.7	0.9		Brown, moist, subrounded gravel, fine to medium sand
6		5		S2	1 2 2 3	SP	Poorly graded SAND		96	4		0.2	27	Gray, wet, fine sand
7.5		6			3 10 10 10	GP	Poorly graded GRAVEL with Sand				25.4	0.6		0.6 m of heaving sand Brown, wet, subrounded gravel, fine to medium sand
9		7			2 1/300 mm 1 1 1	GP	Poorly graded GRAVEL with Sand				19.1	1.1		1.5 m of heaving sand Gray, wet, subrounded gravel, fine to medium sand
10														

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EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230*
Fort Wainwright, Alaska

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Date: *30 Jan 2001*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *1,209,161 m* Easting: *423,834 m*

Top of Hole Elevation: *137.6 m*

Hole Number, Field: *AP-29* Permanent: *AP-7944*

Driller: *Bill Tester*

Inspector: *Steve Henslee*

Type of Hole: ☐ other ____ ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *5.00 m WD*

Depth Drilled: *15.1 m*

Total Depth: *15.7 m*

Hammer Weight: *136 kg*

Split Spoon I.D: *63.5 mm*

Size and Type of Bit: *203.2 mm Rock Bit*

Type of Equipment: *Acker Soil Max*

Type of Samples: *Grab and Drive*

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
10.5														Unable to collect sample at 10.5 m due to heaving sand
12														Unable to collect sample at 12 m due to heaving sand
15		8			20 21 15 18	SP	Poorly graded SAND				12.7	0.4		1.1 m of heaving sand Gray, wet, subrounded gravel, fine to medium sand
15.7														Bottom of Hole 15.7 m Elevation 121.9 m Groundwater Encountered While Drilling: at depth 5.00 m PID = (Hot) Photo Ionization Detector

Depth scale: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7944*

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EXPLORATION LOG

Project: *FAMILY HOUSING UPGRADE - FTW230*, *Fort Wainwright, Alaska*	Page 1 of 2; Date: *31 Jan 2001*
Drilling Agency: ☒ Alaska District ☐ Other	Elevation Datum: ☒ MSL ☐ other
Location: Northing: *1,209,096 m* Easting: *423,943 m*	Top of Hole Elevation: *137.7 m*
Hole Number, Field: *AP-30* Permanent: *AP-7945*	Driller: *Bill Tester*
Inspector: *Steve Hanslee*	
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: *5.00 m WD*
Depth Drilled: *15.1 m*	Total Depth: *15.7 m*
Hammer Weight: *136 kg*	Split Spoon I.D.: *63.5 mm*
Size and Type of Bit: *203.2 mm Rock Bit*	Type of Equipment: *Acker Soil Max*
Type of Samples: *Grab and Drive*	

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
0		1	Nbn		Grab	ML	SILT				6.4	3.6		Dark brown, frozen to moist, coarse sand, nonplastic (NP) fines, possibly fill
1–2		2		F2	6 5 5 5	SM	Silty SAND		55	45		2.2	7	Brown, moist, fine sand, NP fines, possibly fill
3		3		PFS	3 4 6 10	GP-GM	Poorly graded GRAVEL with Silt and Sand	58	37	5	50.8	2.6	2	Brown, moist, subrounded gravel, fine to coarse sand
4–5		4			10 20 15 12	SP	Poorly graded SAND with Gravel				25.4	6.2		Brown, moist, subangular gravel, fine to coarse sand
6		5			5 9 11 8	SP	Poorly graded SAND				12.7	1.0		Gray, wet, subangular gravel, fine to coarse sand
7–8		6			15 22 22 20	SP	Poorly graded SAND with Gravel				31.8			0.3 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand, NP fines
9–10		7			11 11 19 16	SP	Poorly graded SAND with Gravel				38.1	0.6		0.6 m of heaving sand Gray, wet, subangular gravel, fine to coarse sand

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Project: *FAMILY HOUSING UPGRADE - FTW230*

Hole Number: *AP-7945*

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Project: FAMILY HOUSING UPGRADE - FTW230, Fort Wainwright, Alaska	Page 2 of 2; Date: 31 Jan 2001
Drilling Agency: ☒ Alaska District ☐ Other	Elevation Datum: ☒ MSL ☐ other
Location: Northing: 1,209,096 m; Easting: 423,943 m	Top of Hole Elevation: 137.7 m
Hole Number, Field: AP-30; Permanent: AP-7945	Driller: Bill Tester; Inspector: Steve Henslee
Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer	Depth to Groundwater: 5.00 m WD; Depth Drilled: 15.1 m; Total Depth: 15.7 m
Hammer Weight: 136 kg; Split Spoon I.D.: 63.5 mm; Size and Type of Bit: 203.2 mm Rock Bit	Type of Equipment: Acker Soil Max; Type of Samples: Grab and Drive

Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	Grain Size %Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water	Description and Remarks
11		8			7 13 8 8	SP	Poorly graded SAND with Gravel				19.1	0.5		0.6 m of heaving sand Gray, wet, subrounded gravel, fine to coarse sand
12		9			12 12 14 15	SP	Poorly graded SAND with Gravel				31.8	0.5		Gray, wet, subrounded gravel, fine to coarse sand
13–14														Unable to collect sample at 13.6 m due to heaving sand
15		10			13 13 21 21	SP	Poorly graded SAND with Gravel				50.8	0.6		Gray, wet, subrounded gravel, fine to coarse sand
16–20														Bottom of Hole 15.7 m Elevation 122.0 m Groundwater Encountered While Drilling: at depth 5.00 m PID = (Hot) Photo Ionization Detector

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Hole Number: AP-7945

APPENDIX B

LABORATORY RESULTS

of

SELECTED SOIL SAMPLES

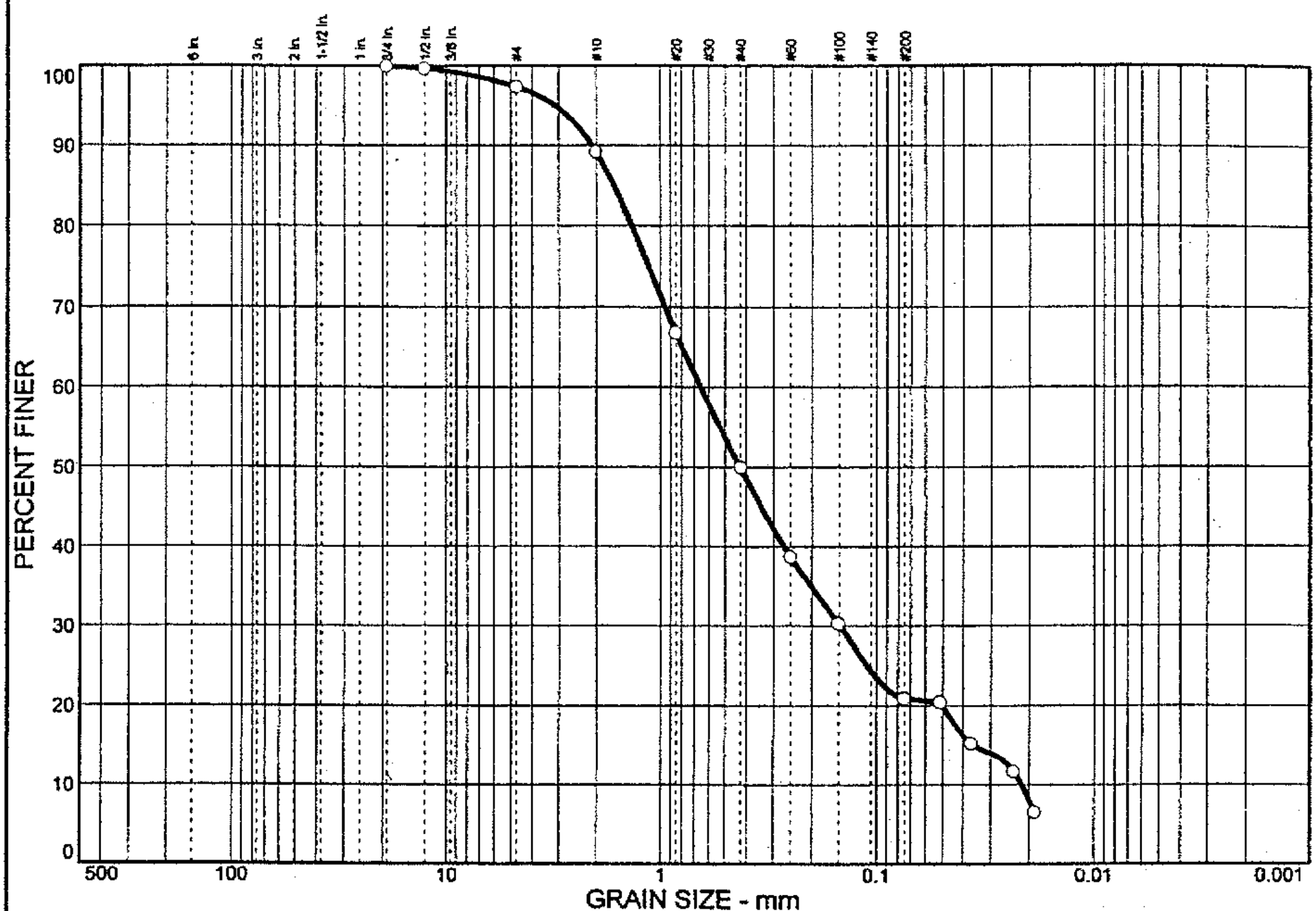
01-369.08
Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Laboratory Testing Summary

Sample:	Depth (Ft.):	Soil Class:	Frost Class:	% Moisture:
AP-1/2	4.5-6.5	SM	F 2, 7.7%-.02mm	30.0
AP-1/4	14.5-16.5	SM	F 2, 7.3%-.02mm	27.3
AP-2/1	0.0-2.0	ML	F 4, 23.2%-.02mm	13.9
AP-2/3	9.5-11.5	SP	NFS*, 1.4%-.02mm	2.0
AP-4/3	9.5-11.5	SP-SM	NFS*, 1.2%-.02mm	4.3
AP-5/2	4.5-6.5	ML	F 4, 44.0%-.02mm	25.9
AP-5/3	7.5-9.5	GW-GM	PFS**, 1.9%-.02mm	1.8
AP-6/2	4.5-6.5	ML	F 4, 19.3%-.02mm	21.4
AP-6/3	9.5-11.5	GP-GM	PFS**, 2.1%-.02mm	2.4
AP-7/2	4.5-6.5	ML	F 4, 14.3%-.02mm	14.8
AP-7/3	9.5-11.5	GP-GM	NFS*, 1.4%-.02mm	1.4
AP-8/2	4.5-6.5	SM	F 2, 12.4%-.02mm	9.3
AP-8/3	9.5-11.5	GW-GM	PFS**, 2.5%-.02mm	1.9
AP-9/3	9.5-11.5	ML	F 4, 23.7%-.02mm	18.6
AP-10/2	4.5-6.5	ML	F 4, 16.7%-.02mm	23.9
AP-10/3	9.5-11.5	GP	NFS*, 0.6%-.02mm	1.9
AP-11/2	4.0-6.0	ML	F 4, 10.9%-.02mm	14.5
AP-11/3	9.0-11.0	GP-GM	NFS*, 1.5%-.02mm	1.4
AP-12/3a	9.5-11.5	ML	F 4, 4.0%-.02mm	10.8
AP-13/3	9.5-11.5	SM	S 2, 4.5%-.02mm	20.1
AP-14/2	4.5-6.5	SM	F 2, 10.1%-.02mm	11.3
AP-14/3b	9.5-11.5	SW-SM	NFS*, 2.3%-.02mm	3.9
AP-15/2	4.5-6.5	SM	F 2, 11.8%-.02mm	22.1
AP-15/3	9.5-11.5	SM	F 2, 10.7%-.02mm	28.0
AP-16/2	4.5-6.5	SM	F 2, 10.4%-.02mm	11.9
AP-16/3	9.5-11.5	SM	F 2, 7.8%-.02mm	27.7
AP-17/2	4.5-6.5	ML	F 4, 13.2%-.02mm	16.5
AP-17/3	9.5-11.5	SM	F 2, 12.9%-.02mm	16.4
AP-18/3	9.5-11.5	SP	NFS*, 1.1%-.02mm	2.0
AP-19/2	4.5-6.5	SM	S 2, 5.9%-.02mm	13.3
AP-19/3	9.5-11.5	SP	NFS*, 1.9%-.02mm	2.9
AP-20/2	5.0-7.0	ML	F 4, 58.4%-.02mm	34.3
AP-20/3	10.0-12.0	ML	F 4, 9.6%-.02mm	22.4
AP-21/3	9.5-11.5	ML	F 4, 37.3%-.02mm	38.3
AP-21/4	14.5-16.5	ML	NFS*, 0.0%-.02mm	40.0
AP-22/2	4.5-6.5	SM	F 2, 7.3%-.02mm	10.4
AP-22/3	9.5-11.5	SP-SM	NFS*, 1.7%-.02mm	7.3
AP-23/2	4.5-6.5	SM	F 2, 10.7%-.02mm	18.4
AP-23/4	14.5-16.5	SM	F 2, 11.0%-.02mm	27.6
AP-24/2	4.5-6.5	ML	F 4, 12.4%-.02mm	2.3
AP-24/3	9.5-11.0	ML	F 4, 31.9%-.02mm	39.9
AP-25/2	4.5-6.5	SP-SM	NFS*, 2.4%-.02mm	17.9
AP-25/3	9.5-11.5	SM	S 2, 5.8%-.02mm	9.0
AP-26/3	9.5-11.5	SP-SM	NFS*, 2.8%-.02mm	3.4
AP-27/2	4.0-6.0	SM	PFS**, 5.6%-.02mm	5.9
AP-27/3	9.0-11.0	SM	NFS*, 3.0%-.02mm	5.6
AP-28/2	4.0-6.0	ML	F 4, 14.7%-.02mm	15.8

Sample:	Depth (Ft.):	Soil Class:	Frost Class:	% Moisture:
AP-28/3	9.0-11.0	SM	S 2, 3.1%-.02mm	6.2
AP-29/2	4.5-6.5	ML	F 4, 36.6%-.02mm	30.9
AP-29/3	9.5-11.5	GP	NFS*, 1.4%-.02mm	1.8
AP-30/2	4.5-6.5	SM	F 2, 7.0%-.02mm	7.0
AP-30/3	9.5-11.5	GP-GM	PFS**, 1.6%-.02mm	2.0
AP-3/6	25.0-27.0	GP	PFS**, 1.8%-.02mm	7.9
AP-5/5	19.5-21.5	GW	PFS**, 1.7%-.02mm	7.5
AP-13/5	19.5-21.5	GW	PFS**, 1.6%-.02mm	6.6
AP-11/6	24.0-26.0	GP	NFS*, 1.4%-.02mm	7.1
AP-17/4b	14.5-16.5	GP	PFS**, 2.2%-.02mm	9.9
AP-12/4	14.5-16.5	SM	S 2, 5.5%-.02mm	33.3
AP-29/5	19.5-21.5	SP	S 2, 3.2%-.02mm	27.2

*Non Frost Susceptible
**Possibly Frost Susceptible

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.6	76.5	20.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.7		
#4	97.4		
#10	89.2		
#20	66.8		
#40	49.9		
#60	38.7		
#100	30.3		
#200	20.9		

* (no specification provided)

Soil Description

Silty sand.
7.7% finer than 0.02mm.
Frost Class F 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 1.65 D_{60}= 0.654 D_{50}= 0.427
D_{30}= 0.147 D_{15}= 0.0360 D_{10}= 0.0217
C_u= 30.14 C_c= 1.53

Classification

USCS= SM AASHTO=

Remarks

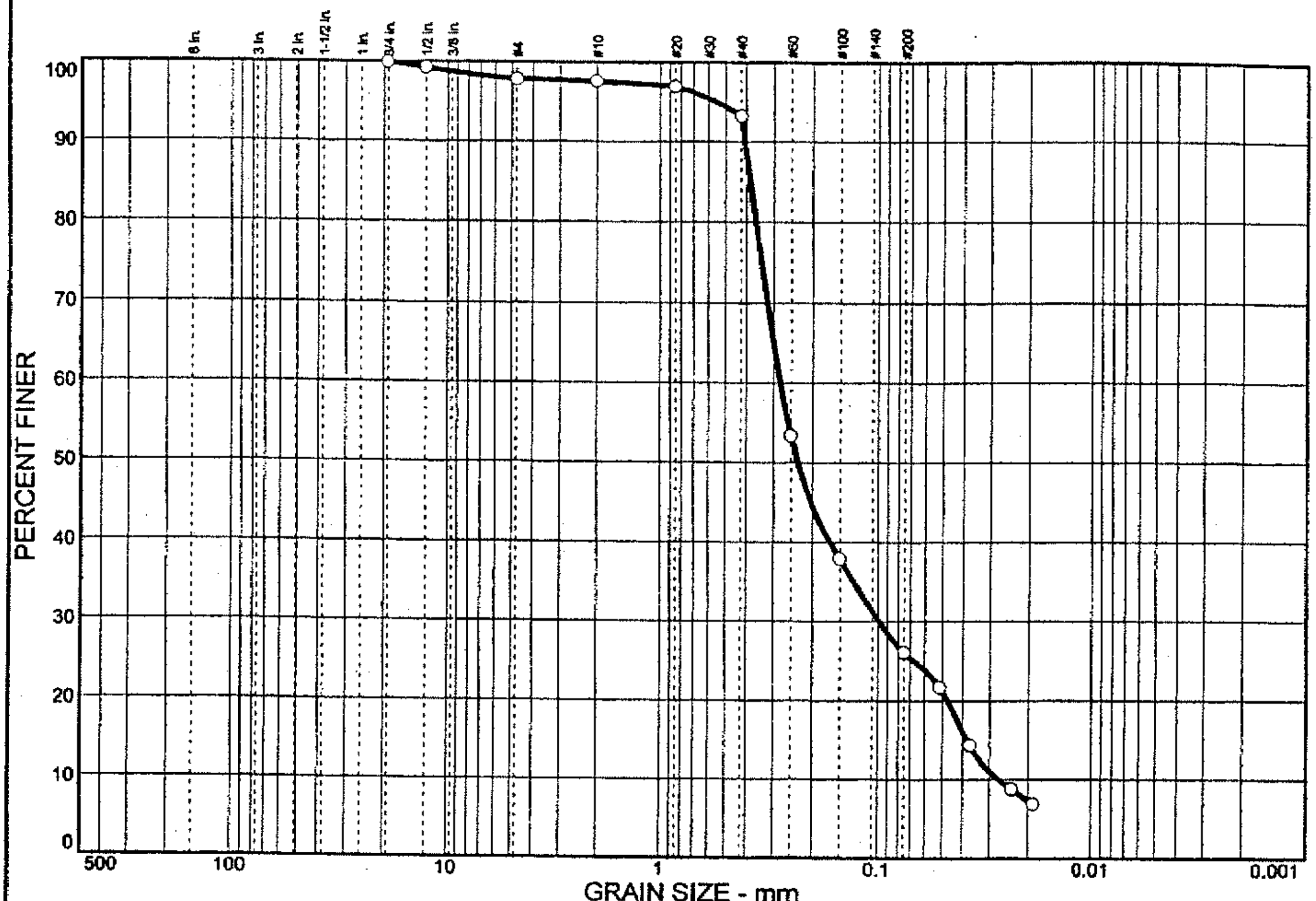
Natural Moisture 30.0%.
Coal Present In Sample.

Sample No.: 2 **Source of Sample:** AP-1 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 1

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.1	71.8	26.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.7500 in.	100.0		
.5 in.	99.3		
#4	97.9		
#10	97.6		
#20	97.0		
#40	93.3		
#60	53.4		
#100	37.9		
#200	26.1		

* (no specification provided)

Soil Description

Silty sand.
7.3% finer than 0.02mm.
Frost Class F 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.386 D_{60}= 0.279 D_{50}= 0.233
D_{30}= 0.0988 D_{15}= 0.0383 D_{10}= 0.0273
C_u= 10.23 C_c= 1.28

Classification

USCS= SM AASHTO=

Remarks

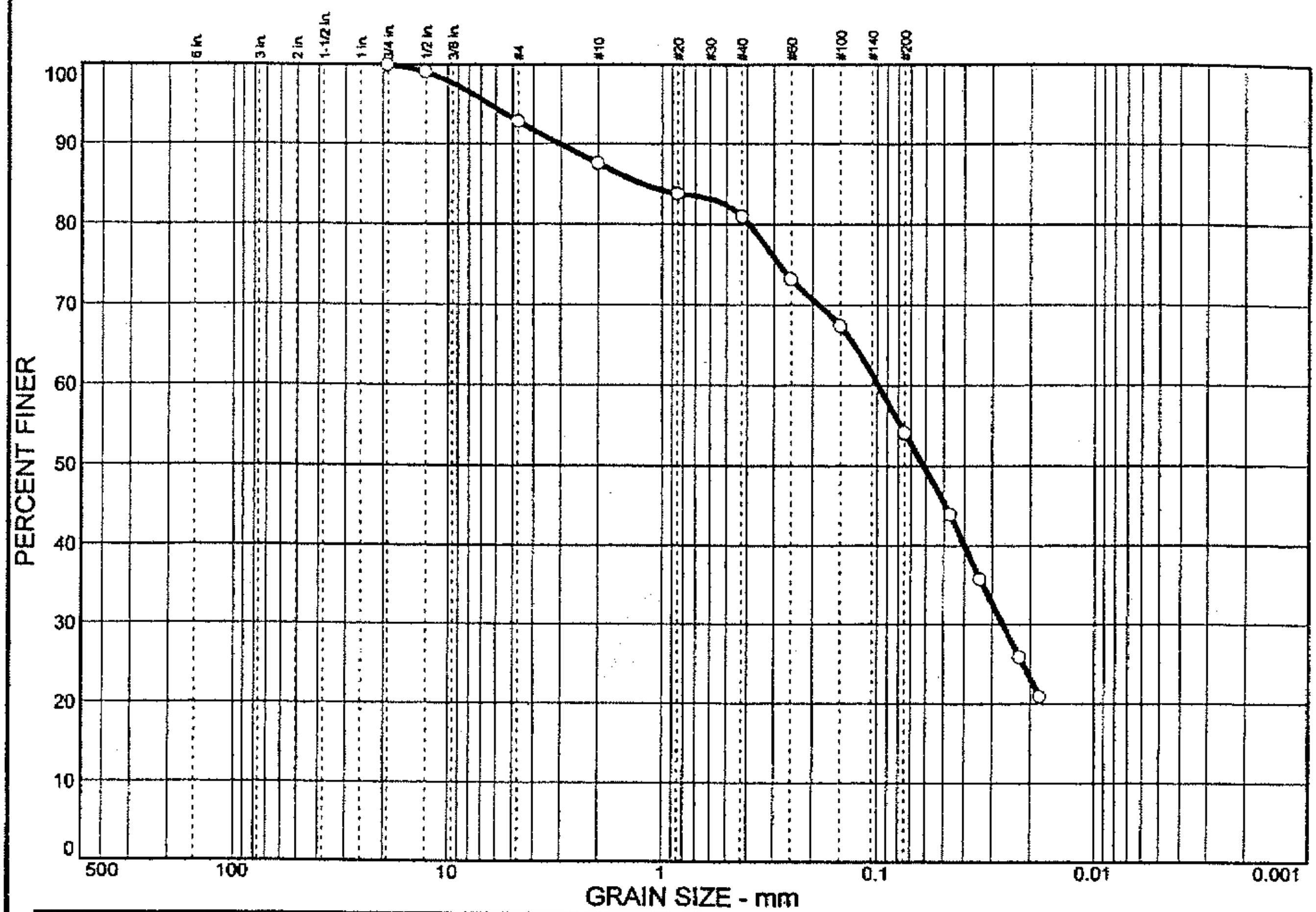
Natural Moisture 27.3%.
Sticks And Organics Present In Sample.

Sample No.: 4 **Source of Sample:** AP-1 **Date:** 2/26/01
Location: **Elev./Depth:** 14.5-16.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 2

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.1	38.8	54.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.1		
#4	92.9		
#10	87.6		
#20	83.8		
#40	81.0		
#60	73.2		
#100	67.4		
#200	54.1		

* (no specification provided)

Soil Description

Sandy silt.
23.2% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 1.22 D_{60}= 0.0993 D_{50}= 0.0613
D_{30}= 0.0268 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

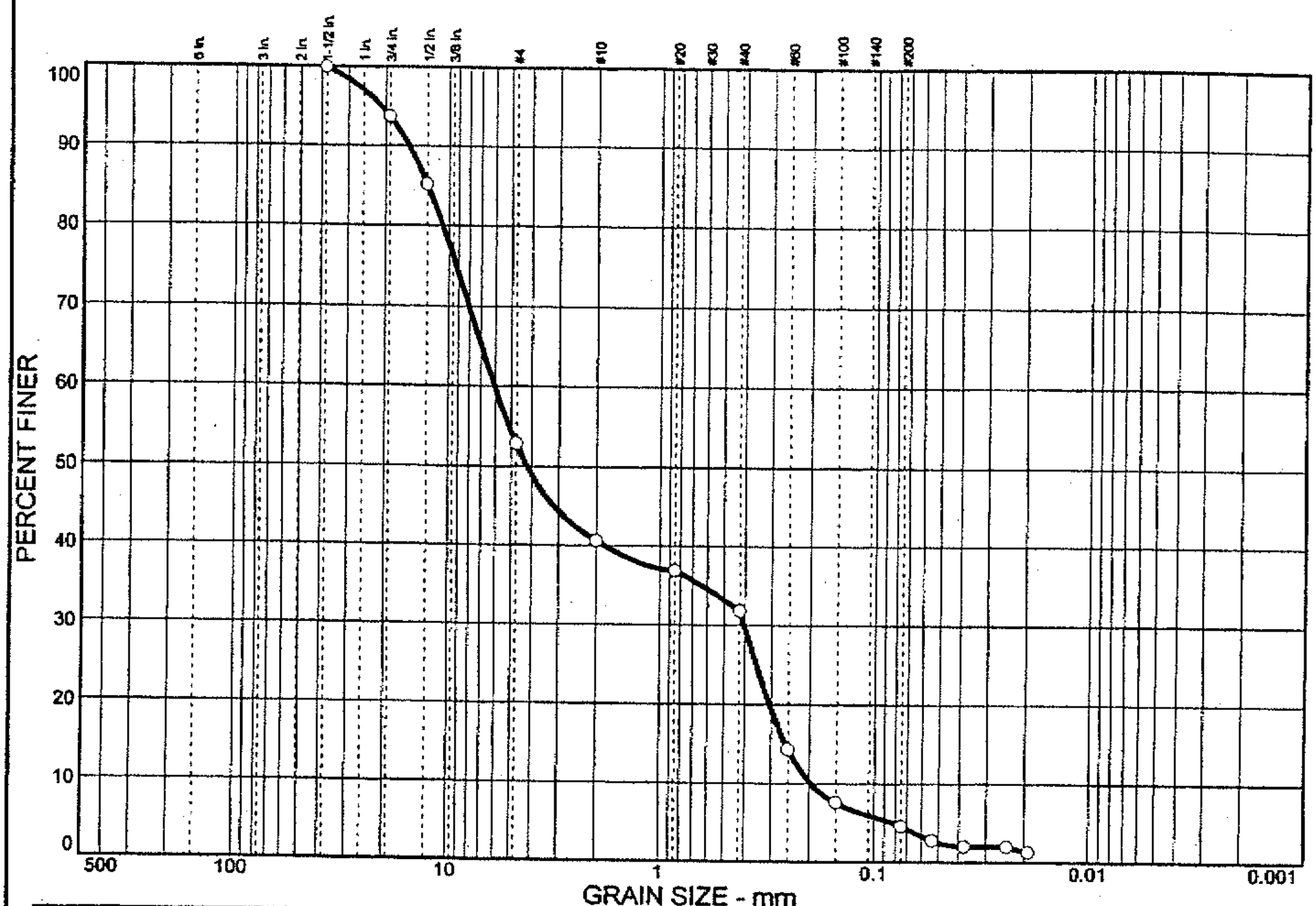
Natural Moisture 13.9%.

Sample No.: 1 Source of Sample: AP-2 Date: 2/26/01
Location: Elev./Depth: 0.0-2.0

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 Plate 3

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	47.2	48.2	4.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	93.7		
.5 in.	85.2		
#4	52.8		
#10	40.6		
#20	36.9		
#40	31.8		
#60	14.3		
#100	7.6		
#200	4.6		

* (no specification provided)

Soil Description

Poorly graded sand with gravel.
1.4% finer than 0.02mm.
Non Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 12.6 D_{60}= 6.04 D_{50}= 4.22
D_{30}= 0.405 D_{15}= 0.257 D_{10}= 0.196
C_u= 30.79 C_c= 0.14

Classification

USCS= SP AASHTO=

Remarks

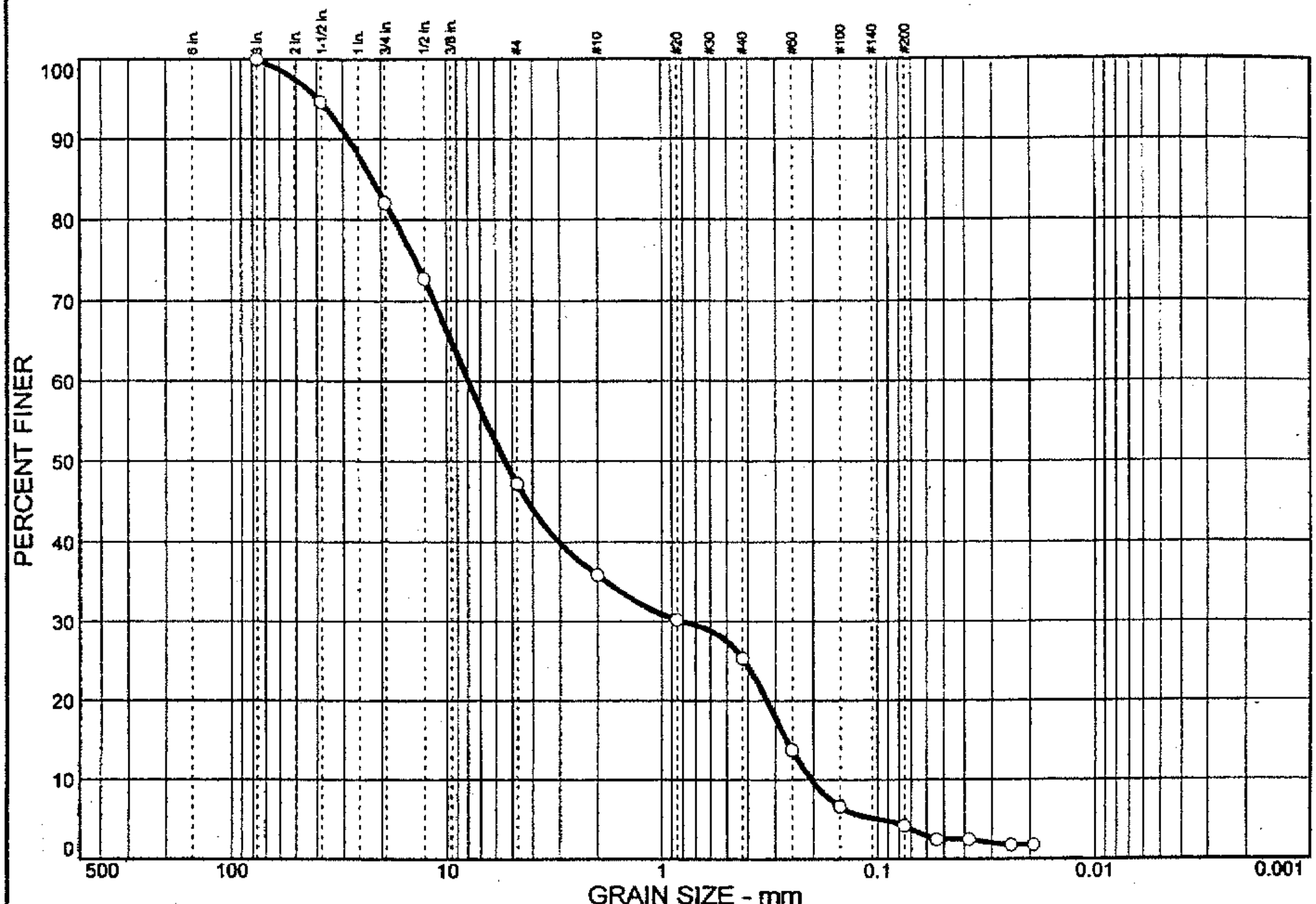
Natural Moisture 2.0%.

Sample No.: 3 **Source of Sample:** AP-2 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 4

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	52.8	43.0	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
1.5 in.	94.7		
.75 in.	82.1		
.5 in.	72.7		
#4	47.2		
#10	35.8		
#20	30.2		
#40	25.3		
#60	13.7		
#100	6.6		
#200	4.2		

* (no specification provided)

Soil Description

Poorly graded gravel with sand.
1.8% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 21.8 D_{60}= 7.95 D_{50}= 5.40
D_{30}= 0.804 D_{15}= 0.266 D_{10}= 0.204
C_u= 39.07 C_c= 0.40

Classification

USCS= GP AASHTO=

Remarks

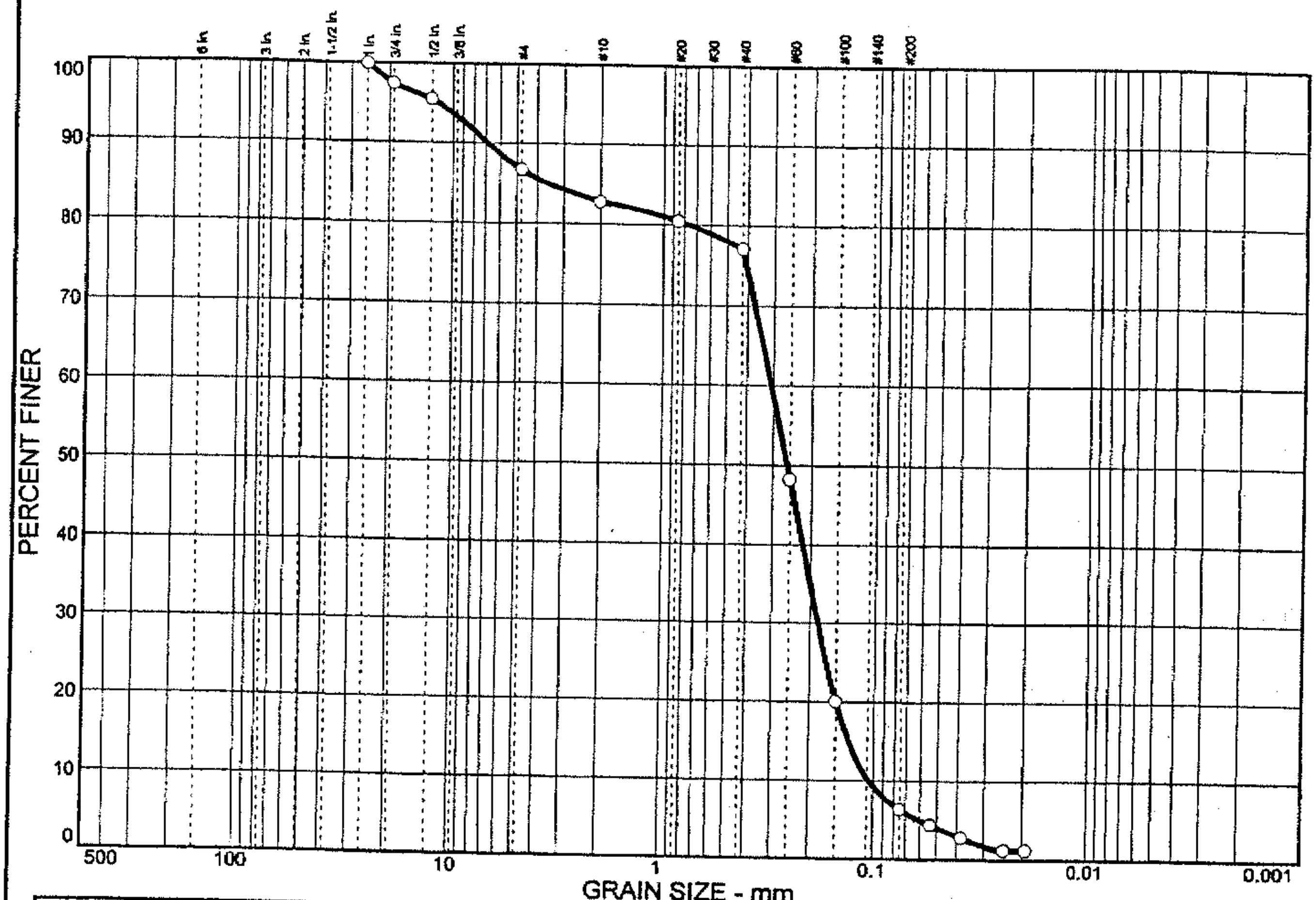
Natural Moisture 7.9%.

Sample No.: 6 **Source of Sample:** AP-3 **Date:** 2/26/01
Location: **Elev./Depth:** 25.0-27.0

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 53

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.3	80.3	6.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	97.5		
.5 in.	95.5		
#4	86.7		
#10	82.7		
#20	80.5		
#40	77.1		
#60	48.2		
#100	20.0		
#200	6.4		

* (no specification provided)

Soil Description

Poorly graded sand with silt.
1.2% finer than 0.02mm.
Non Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 3.56 D_{60}= 0.308 D_{50}= 0.258
D_{30}= 0.184 D_{15}= 0.130 D_{10}= 0.105
C_u= 2.94 C_c= 1.05

Classification

USCS= SP-SM AASHTO=

Remarks

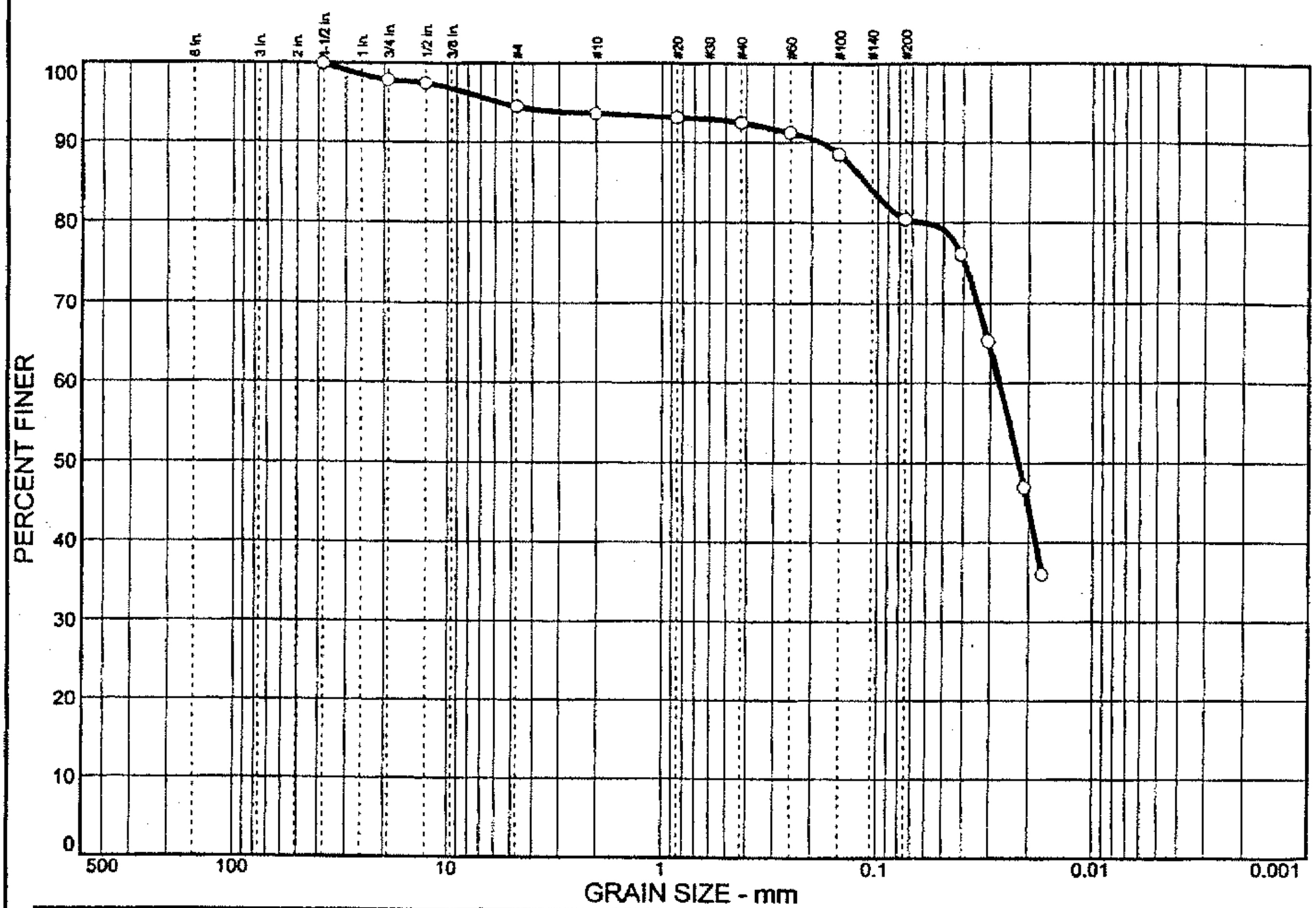
Natural Moisture 4.3%.
Depth On Lab Request Form Does Not Match Depth On Bag.

Sample No.: 3 **Source of Sample:** AP-4 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 5

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.5	14.0	80.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	97.9		
.5 in.	97.5		
#4	94.5		
#10	93.6		
#20	93.1		
#40	92.5		
#60	91.2		
#100	88.6		
#200	80.5		

* (no specification provided)

Soil Description

Silt with sand.
44.0% finer than 0.02mm.
Frost Class F 4

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.113 D_{60}= 0.0274 D_{50}= 0.0223
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

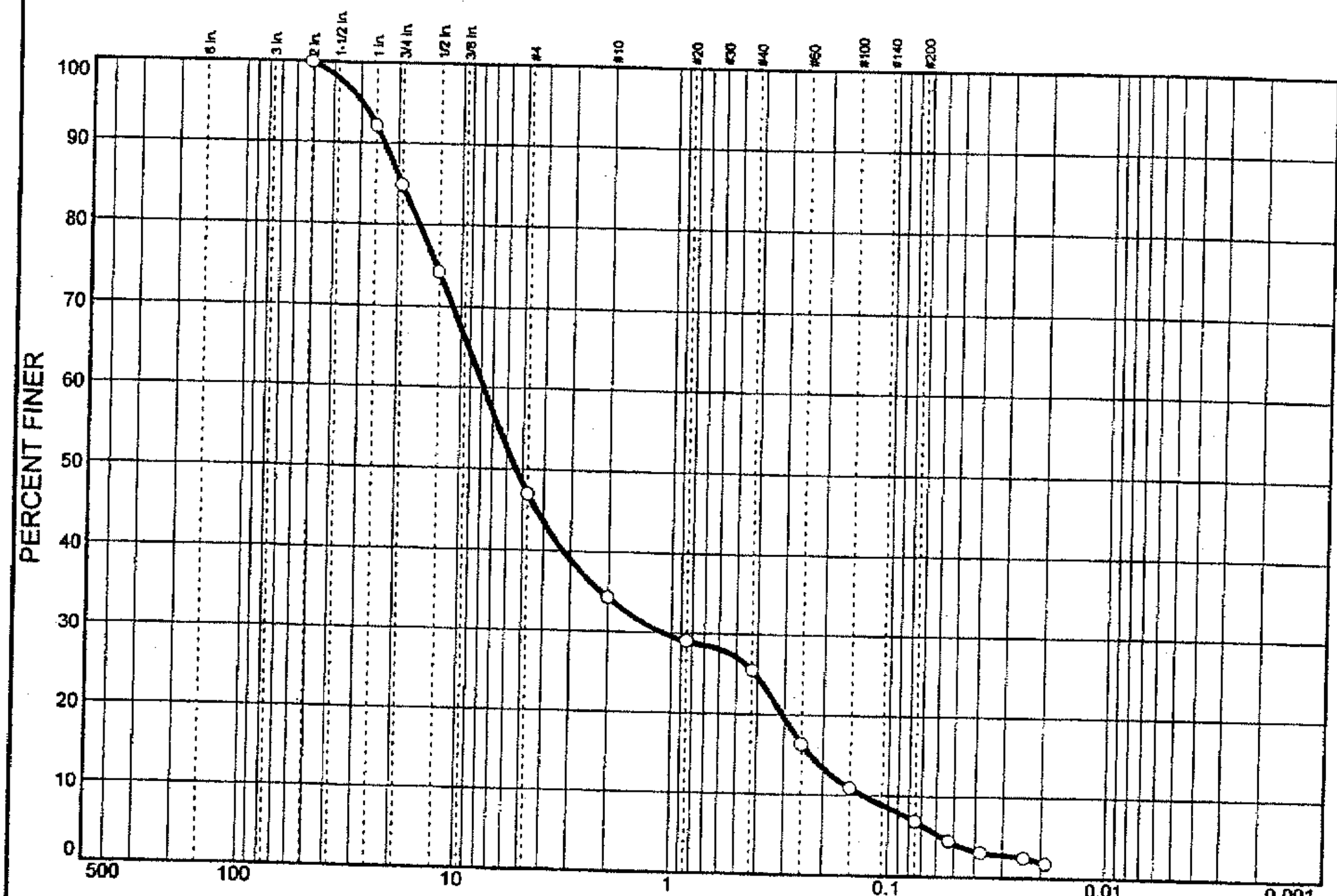
Natural Moisture 25.9%.

Sample No.: 2 Source of Sample: AP-5 Date: 2/26/01
Location: Elev./Depth: 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 Plate 6

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	53.0	40.1	6.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1 in.	92.2		
.75 in.	84.8		
.5 in.	74.2		
#4	47.0		
#10	34.3		
#20	29.0		
#40	25.5		
#60	16.4		
#100	10.9		
#200	6.9		

* (no specification provided)

Soil Description

Well-graded gravel with silt and sand.
1.9% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 19.2 D_{60}= 7.77 D_{50}= 5.39
D_{30}= 1.10 D_{15}= 0.227 D_{10}= 0.130
C_u= 59.54 C_c= 1.20

Classification

USCS= GW-GM AASHTO=

Remarks

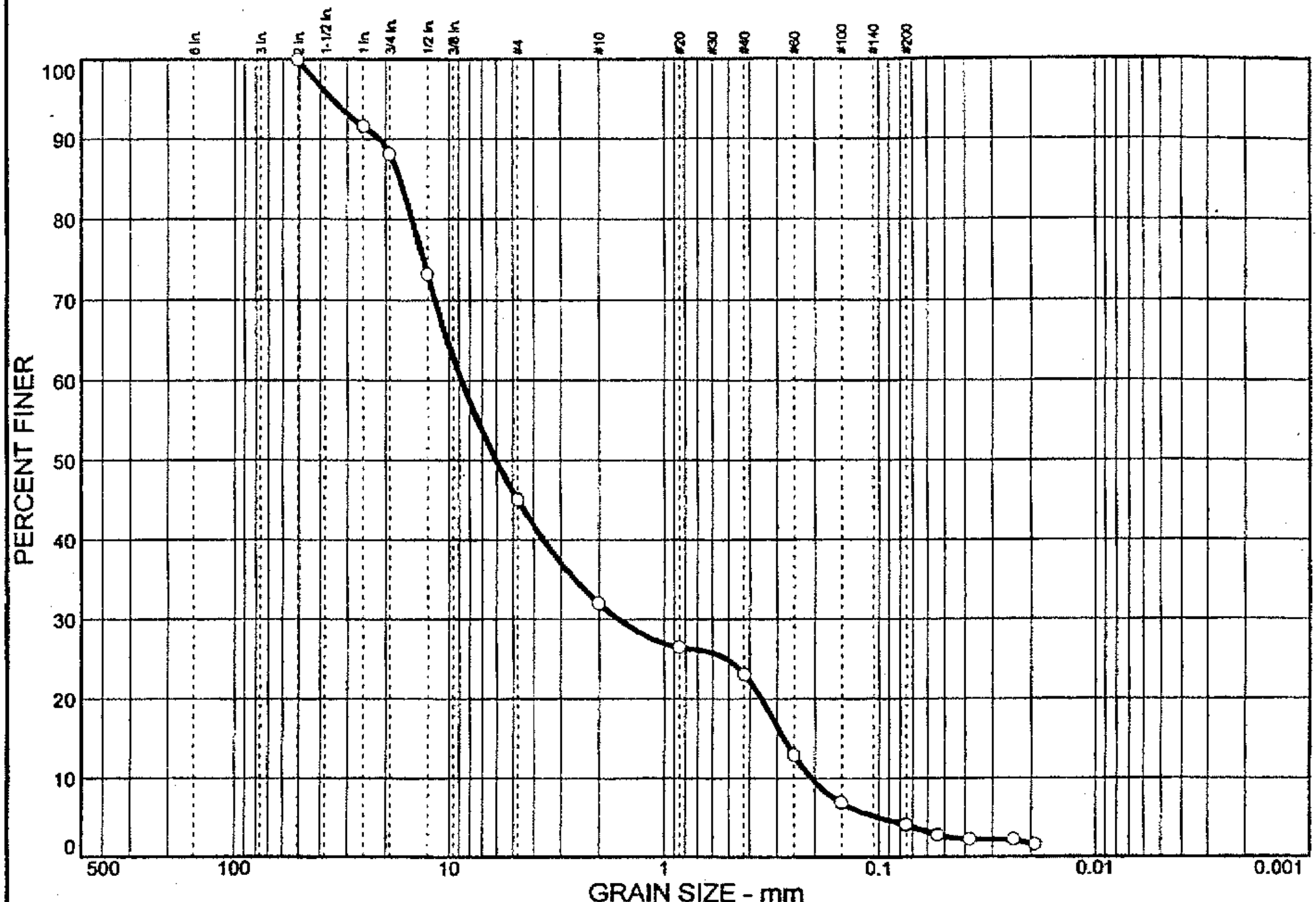
Natural Moisture 1.8%.

Sample No.: 3 **Source of Sample:** AP-5 **Date:** 2/26/01
Location: **Elev./Depth:** 7.5-9.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 7

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	55.0	40.9	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1 in.	91.6		
.75 in.	88.1		
.5 in.	73.2		
#4	45.0		
#10	32.0		
#20	26.5		
#40	23.1		
#60	12.9		
#100	6.9		
#200	4.1		

* (no specification provided)

Soil Description

Well-graded gravel with sand.
1.7% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 17.1 D_{60}= 8.74 D_{50}= 6.00
D_{30}= 1.62 D_{15}= 0.279 D_{10}= 0.207
C_u= 42.23 C_c= 1.46

Classification

USCS= GW AASHTO=

Remarks

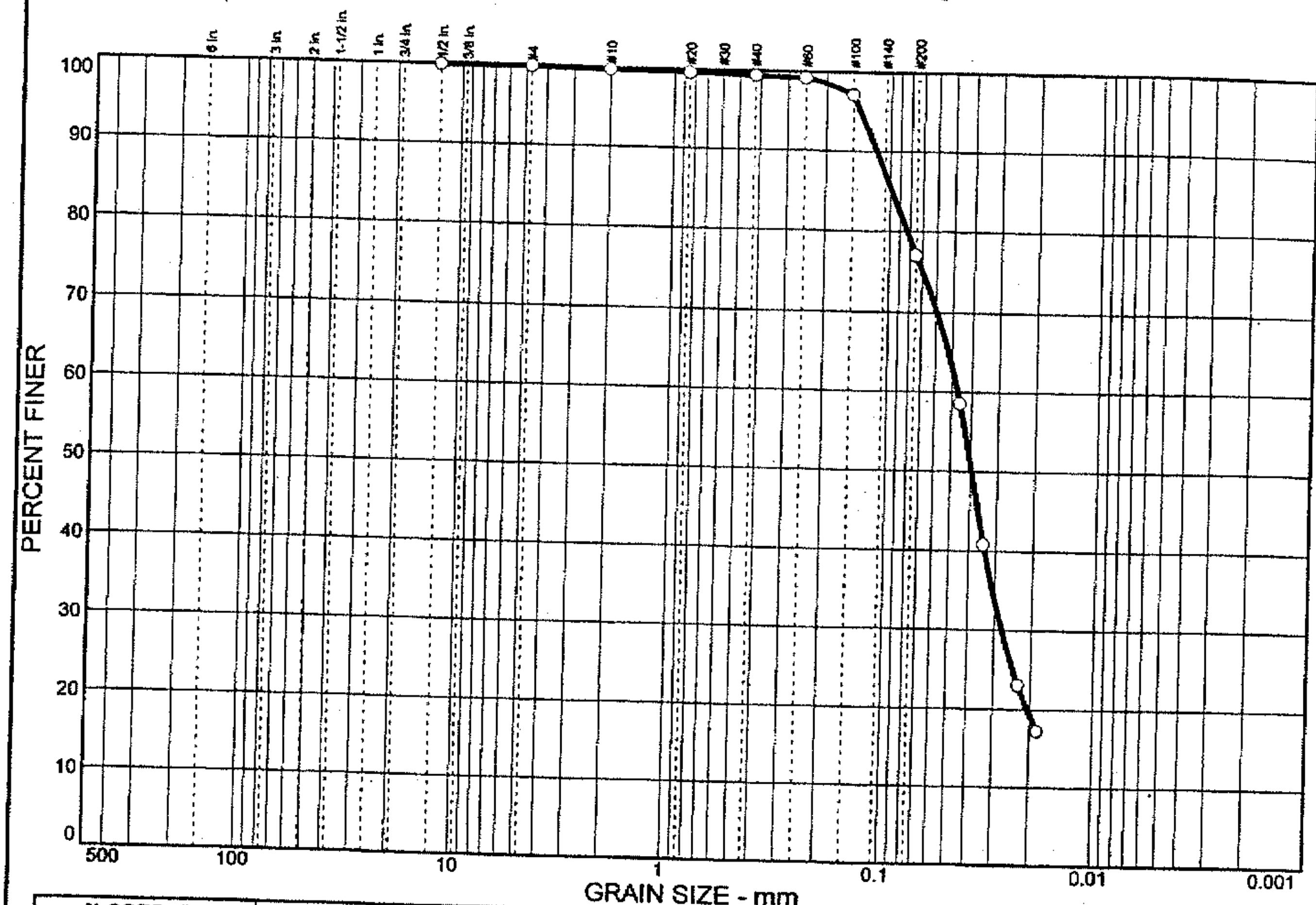
Natural Moisture 7.5%.

Sample No.: 5 **Source of Sample:** AP-5 **Date:** 2/26/01
Location: **Elev./Depth:** 19.5-21.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 54

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	22.9	77.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
#4	100.0		
#10	99.8		
#20	99.6		
#40	99.4		
#60	99.2		
#100	97.2		
#200	77.1		

* (no specification provided)

Soil Description

Silt with sand.
19.3% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.0983 D_{60}= 0.0469 D_{50}= 0.0397
D_{30}= 0.0277 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

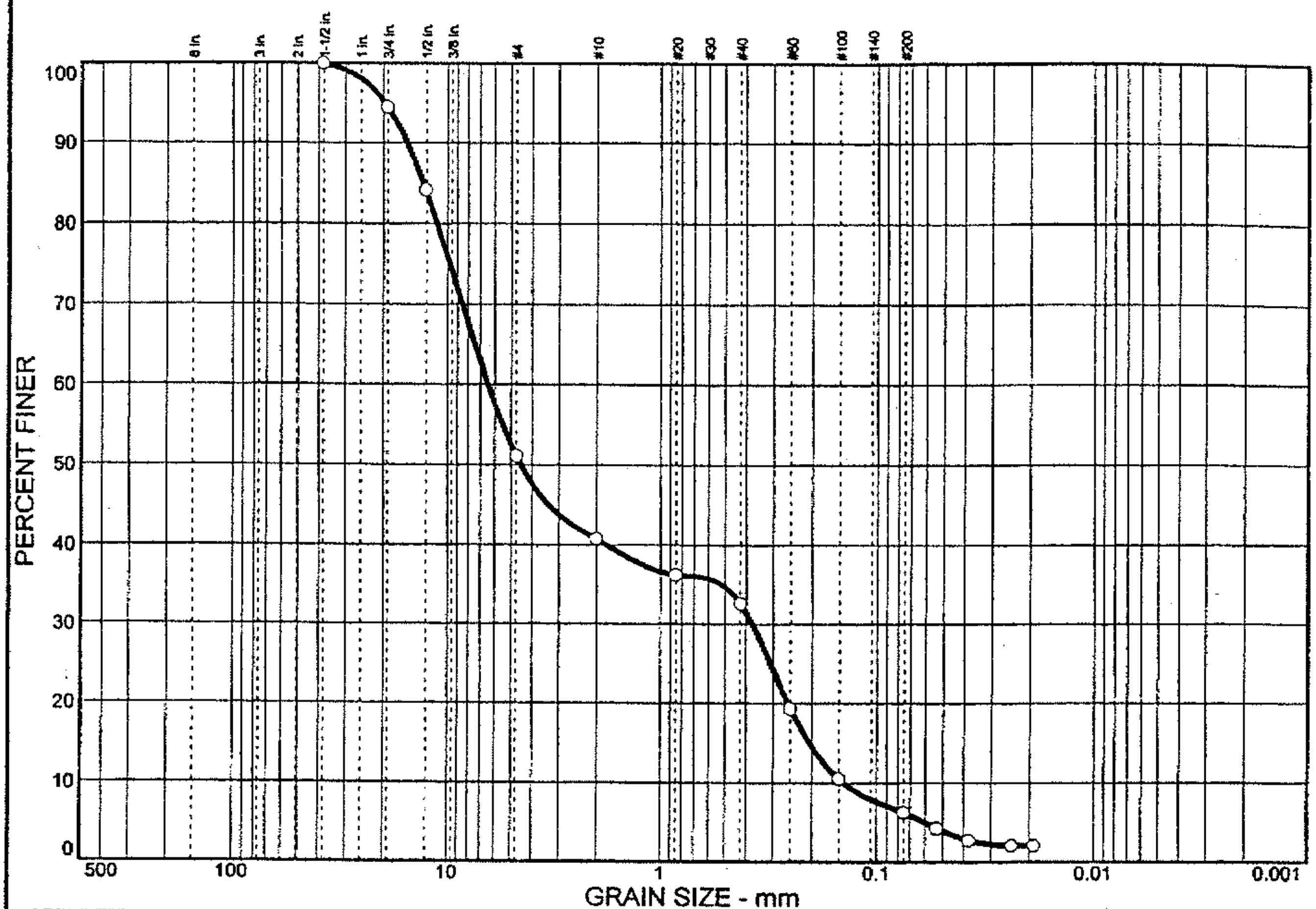
Natural Moisture 21.4%.

Sample No.: 2 **Source of Sample:** AP-6 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 8

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	48.9	44.8	6.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	94.5		
.5 in.	84.1		
#4	51.1		
#10	40.7		
#20	36.2		
#40	32.6		
#60	19.3		
#100	10.5		
#200	6.3		

* (no specification provided)

Soil Description

Poorly graded gravel with silt and sand.
2.1% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 13.1 D_{60}= 6.44 D_{50}= 4.53
D_{30}= 0.375 D_{15}= 0.205 D_{10}= 0.143
C_u= 45.13 C_c= 0.15

Classification

USCS= GP-GM AASHTO=

Remarks

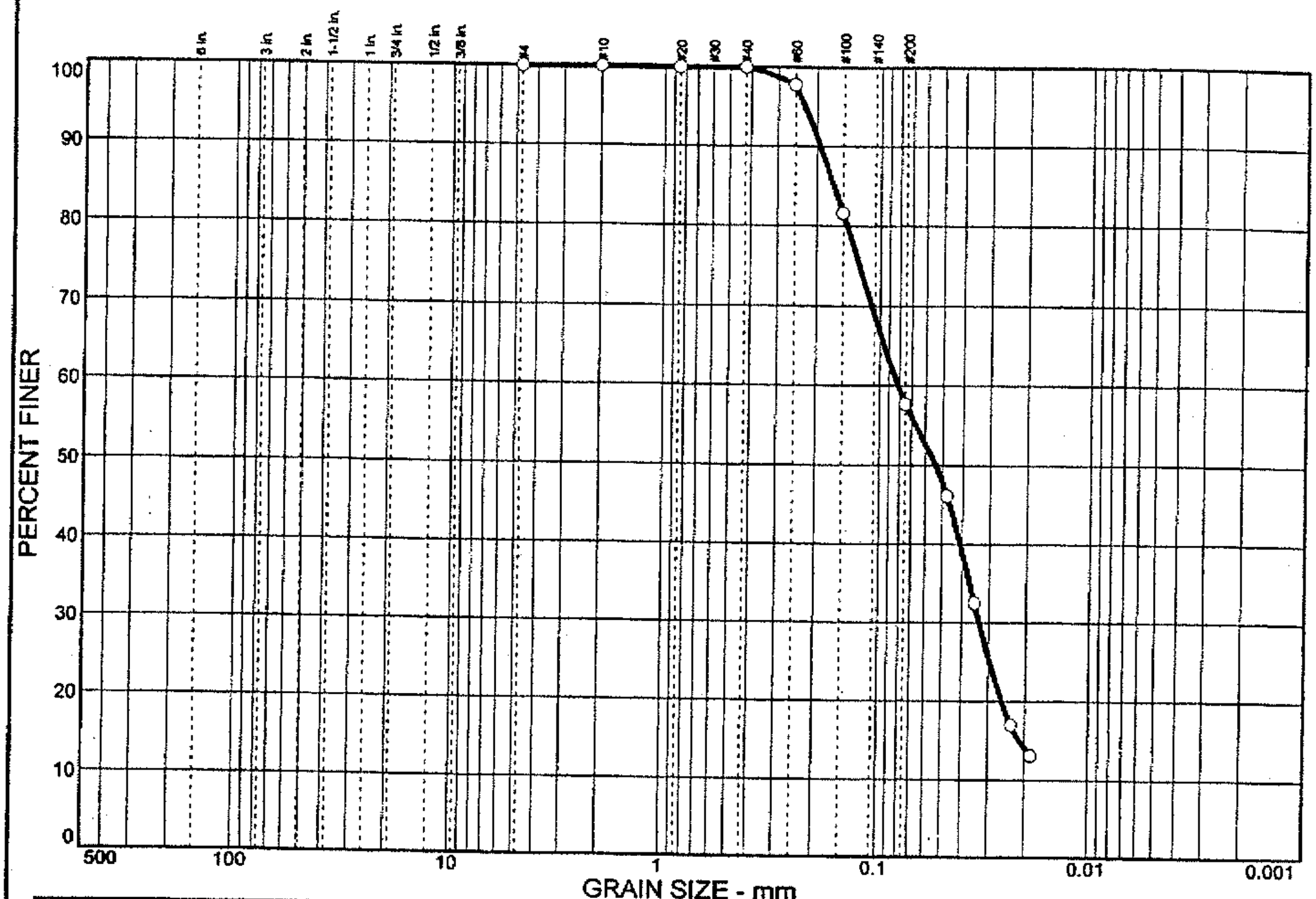
Natural Moisture 2.4%.

Sample No.: 3 **Source of Sample:** AP-6 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 9

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	42.3	57.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	97.8		
#100	81.6		
#200	57.7		

* (no specification provided)

Soil Description

Sandy silt.
14.3% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.165 D_{60}= 0.0816 D_{50}= 0.0538
D_{30}= 0.0333 D_{15}= 0.0211 D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

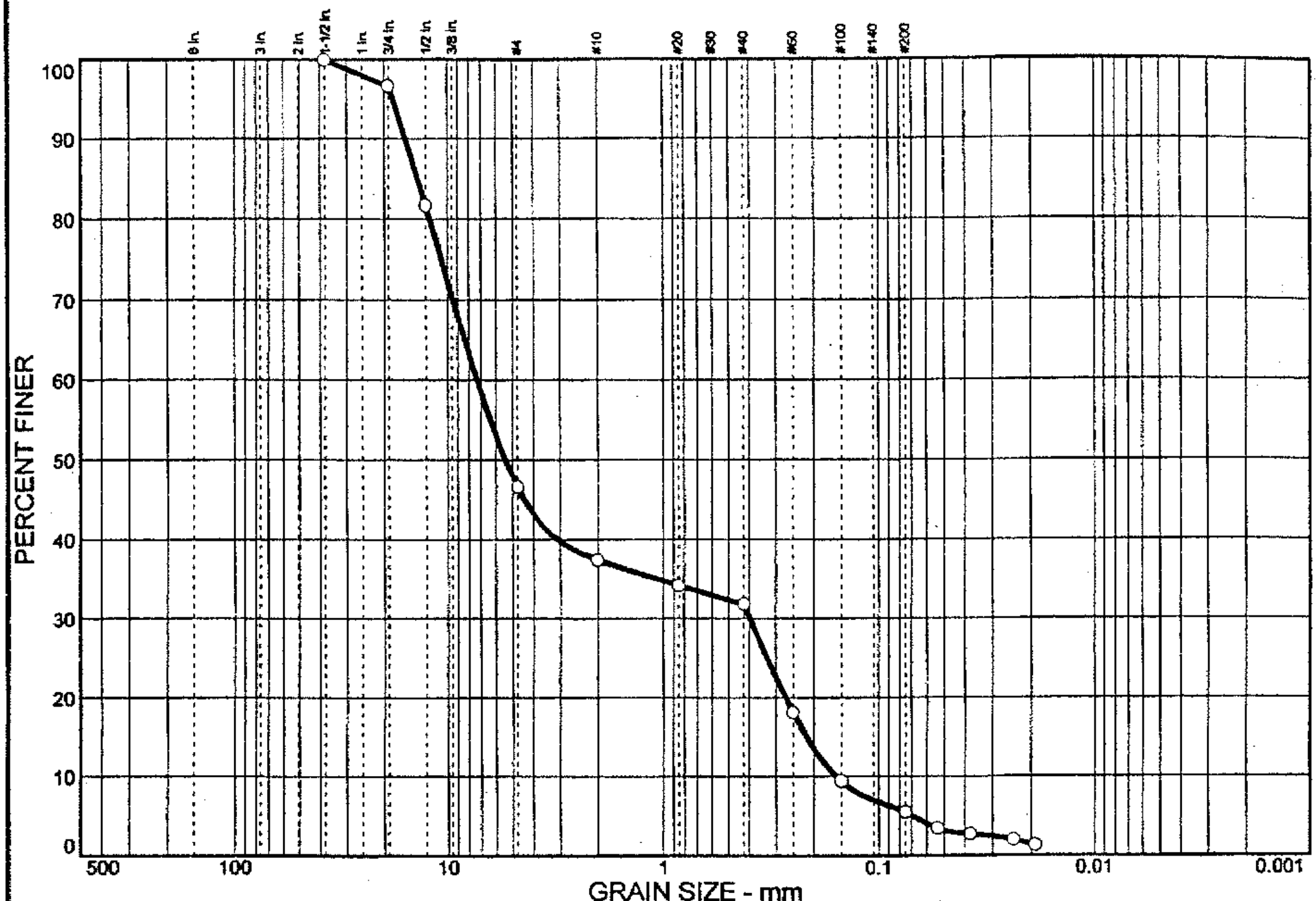
Natural Moisture 14.8%.

Sample No.: 2 **Source of Sample:** AP-7 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 10

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	53.4	41.1	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	96.7		
.5 in.	81.7		
#4	46.6		
#10	37.4		
#20	34.2		
#40	31.8		
#60	18.1		
#100	9.4		
#200	5.5		

* (no specification provided)

Soil Description

Poorly graded gravel with silt and sand.
1.4% finer than 0.02mm.
Non Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 13.8 D_{60}= 7.32 D_{50}= 5.42
D_{30}= 0.398 D_{15}= 0.216 D_{10}= 0.158
C_u= 46.28 C_c= 0.14

Classification

USCS= GP-GM AASHTO=

Remarks

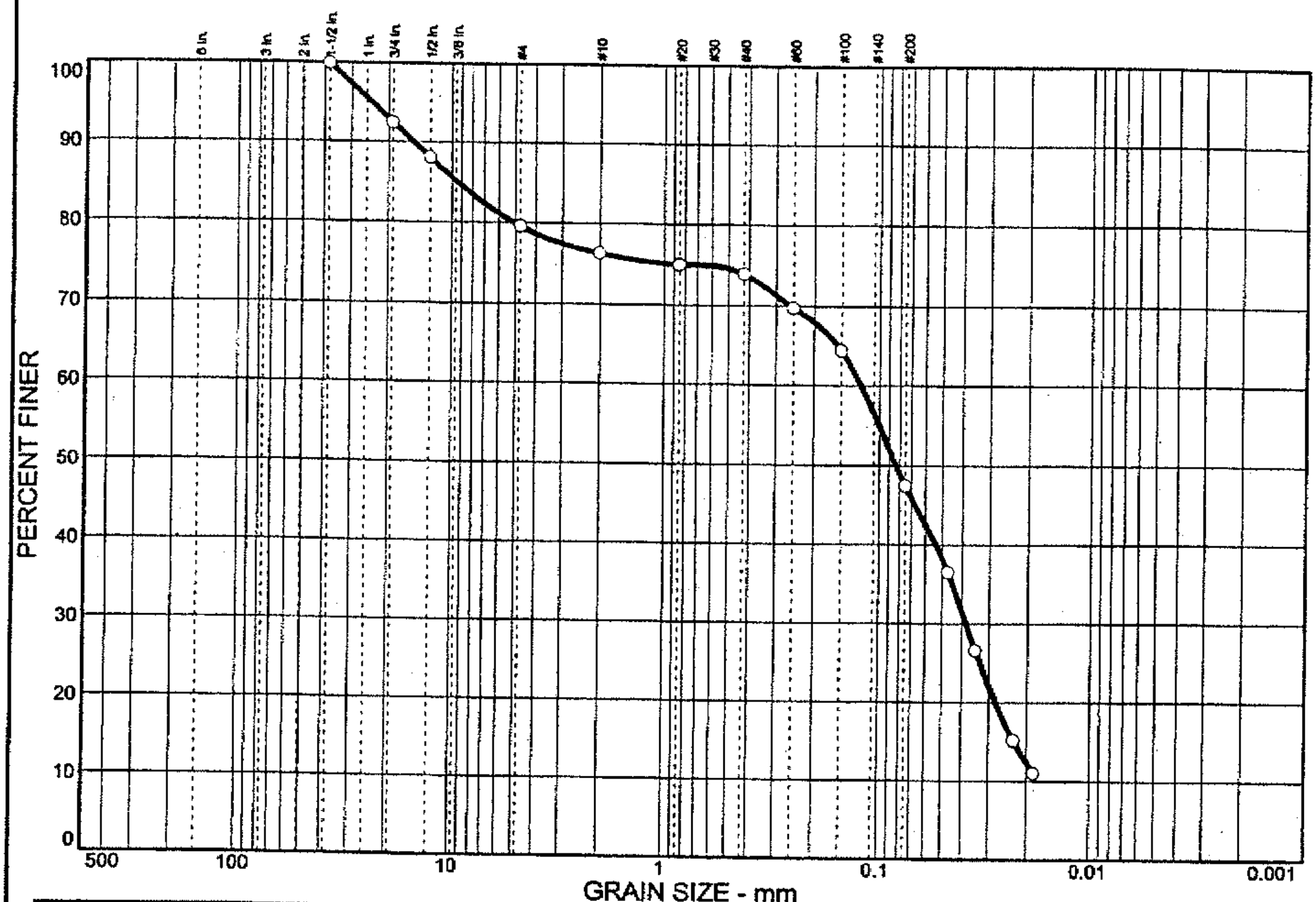
Natural Moisture 1.8%.

Sample No.: 3 **Source of Sample:** AP-7 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 11

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.4	32.2	47.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	92.5		
.5 in.	88.1		
#4	79.6		
#10	76.3		
#20	75.0		
#40	73.9		
#60	69.7		
#100	64.4		
#200	47.4		

* (no specification provided)

Soil Description

Silty sand with gravel.
12.4% finer than 0.02mm.
Frost Class F 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 9.35 D_{60}= 0.122 D_{50}= 0.0833
D_{30}= 0.0384 D_{15}= 0.0228 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

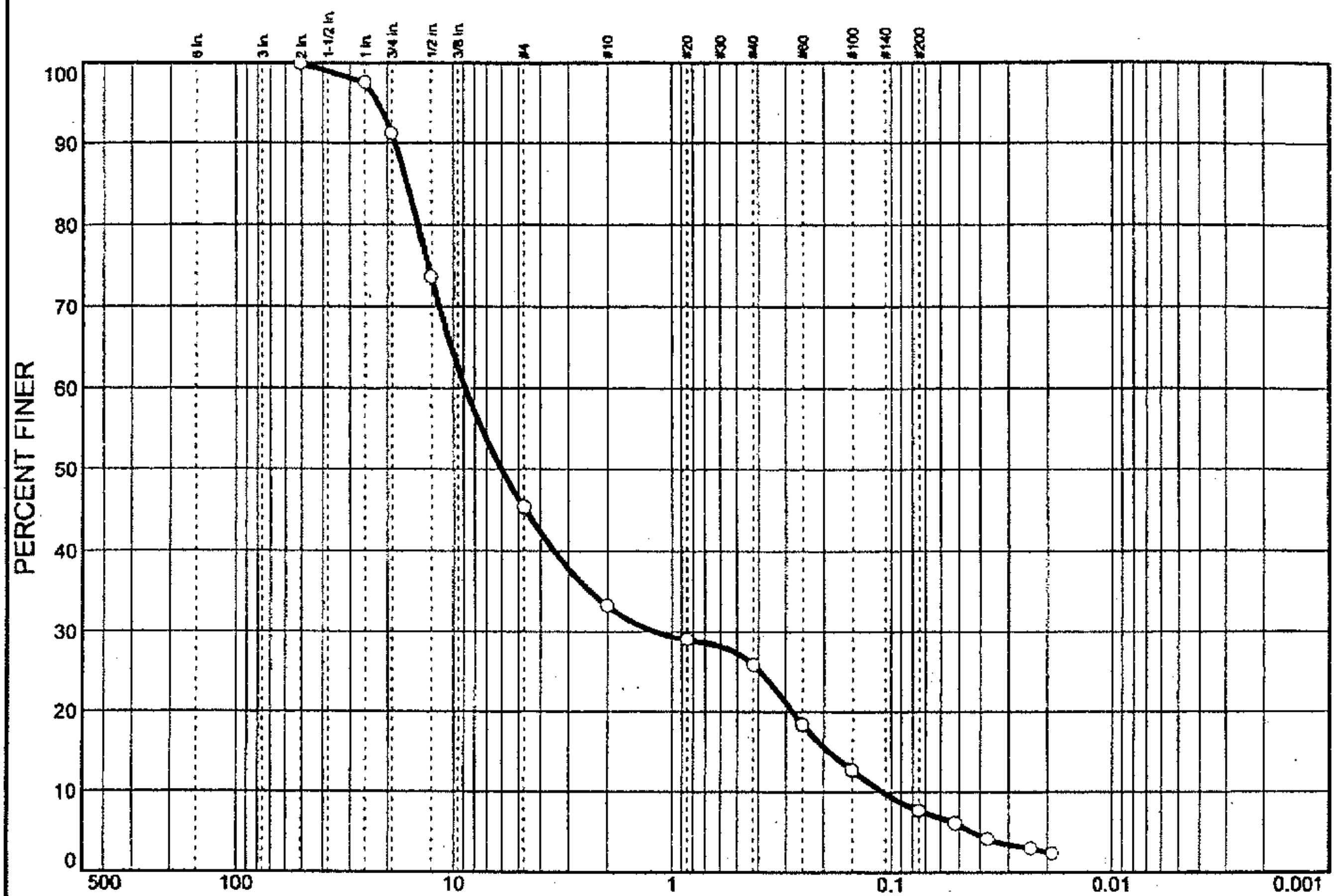
Natural Moisture 9.3%.

Sample No.: 2 **Source of Sample:** AP-8 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 12

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	54.7	37.6	7.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1 in.	97.6		
.75 in.	91.2		
.5 in.	73.7		
#4	45.3		
#10	33.2		
#20	29.0		
#40	25.9		
#60	18.4		
#100	12.7		
#200	7.7		

* (no specification provided)

Soil Description

Well-graded gravel with silt and sand.
2.5% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 16.2 D_{60}= 8.80 D_{50}= 6.00
D_{30}= 1.20 D_{15}= 0.189 D_{10}= 0.109
C_u= 80.87 C_c= 1.50

Classification

USCS= GW-GM AASHTO=

Remarks

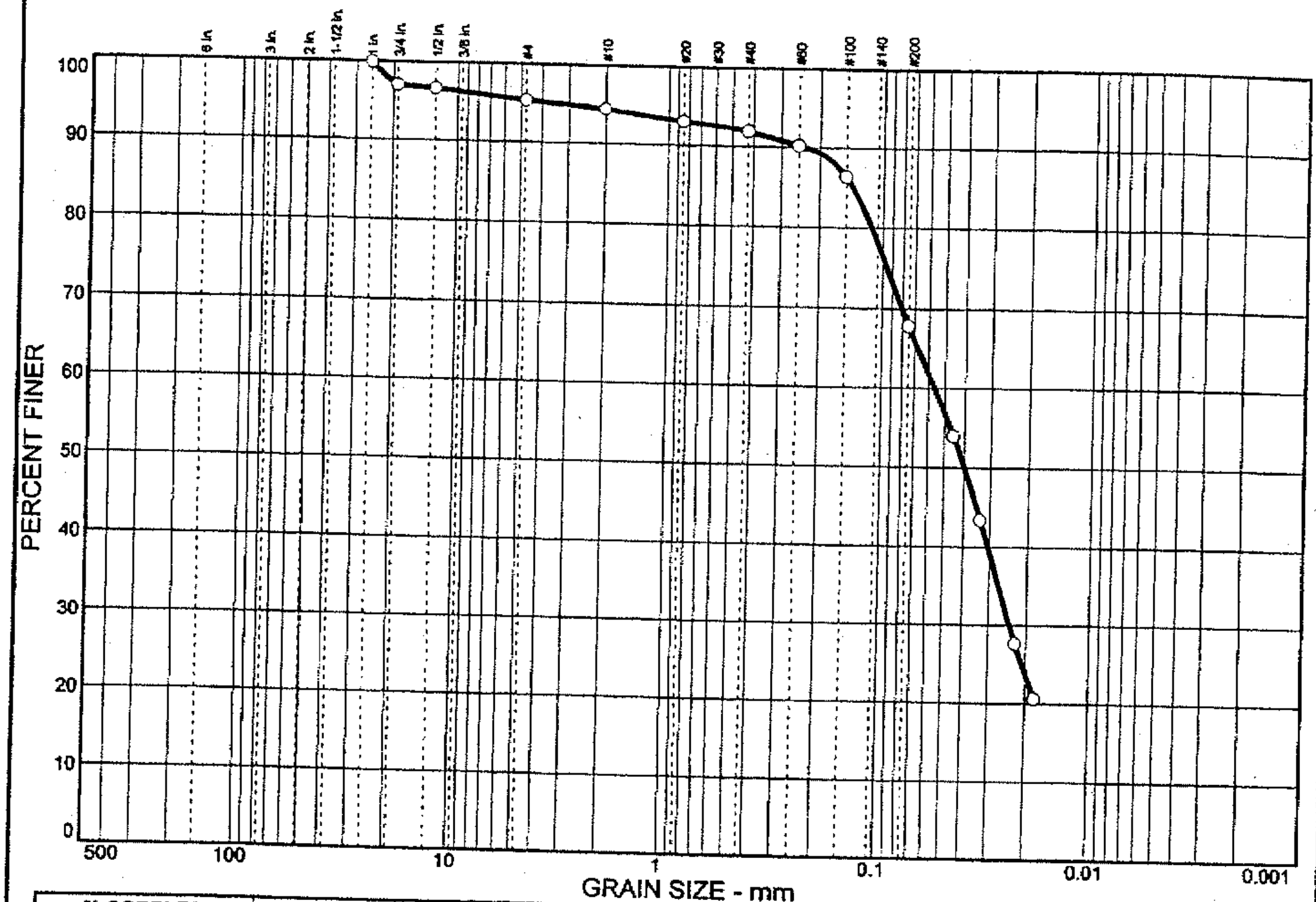
Natural Moisture 1.9%.

Sample No.: 3 **Source of Sample:** AP-8 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 13

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.6	27.6	67.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	97.0		
.5 in.	96.7		
#4	95.4		
#10	94.4		
#20	93.0		
#40	91.9		
#60	90.2		
#100	86.4		
#200	67.8		

* (no specification provided)

Soil Description

Sandy silt.
23.7% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.139 D_{60}= 0.0562 D_{50}= 0.0401
D_{30}= 0.0239 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

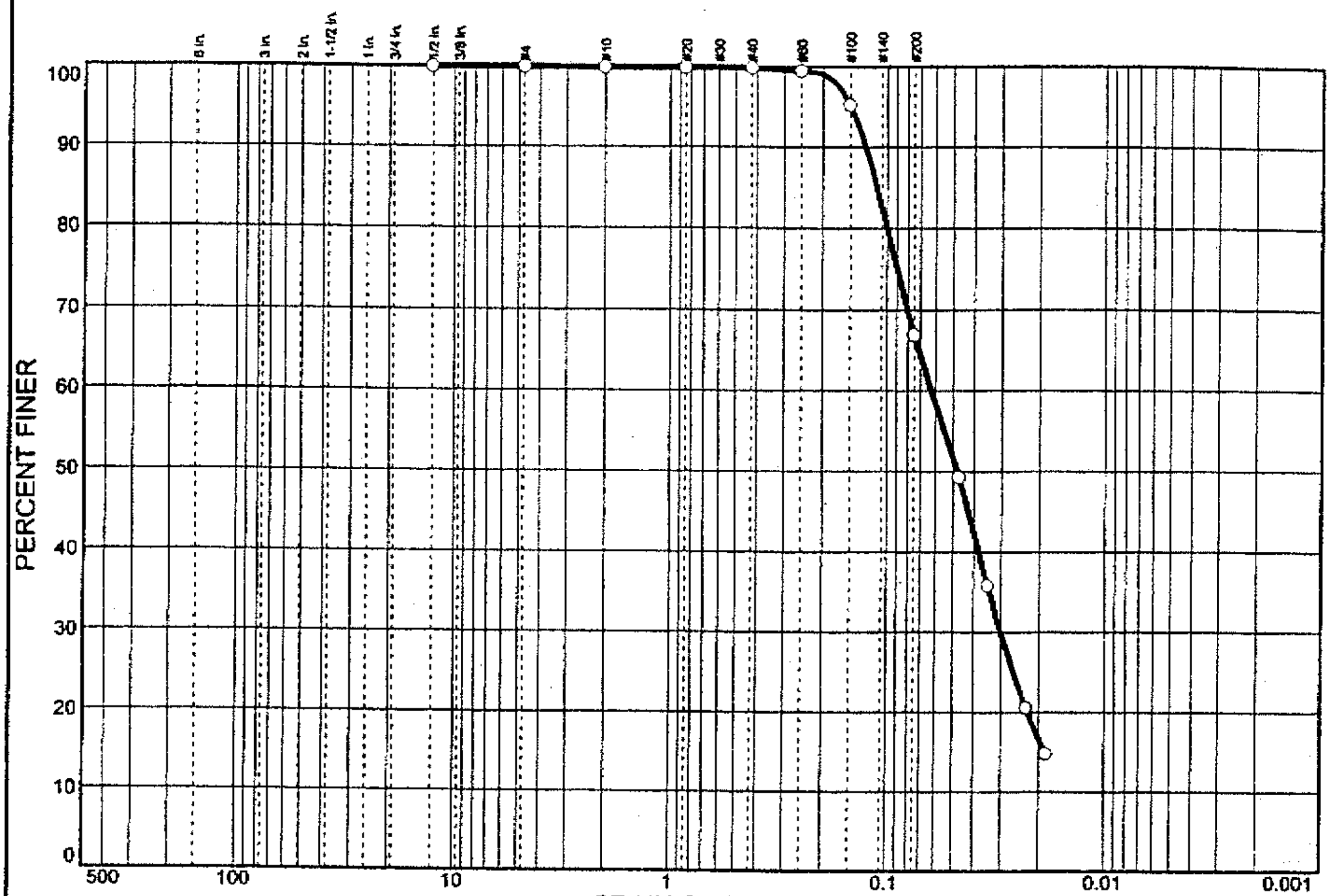
Natural Moisture 18.6%.

Sample No.: 3 Source of Sample: AP-9 Date: 2/26/01
Location: Elev./Depth: 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 Plate 14

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	33.1	66.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.9		
#60	99.5		
#100	95.3		
#200	66.9		

* (no specification provided)

Soil Description

Sandy silt.
16.7% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.112 D_{60}= 0.0626 D_{50}= 0.0478
D_{30}= 0.0302 D_{15}= 0.0187 D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

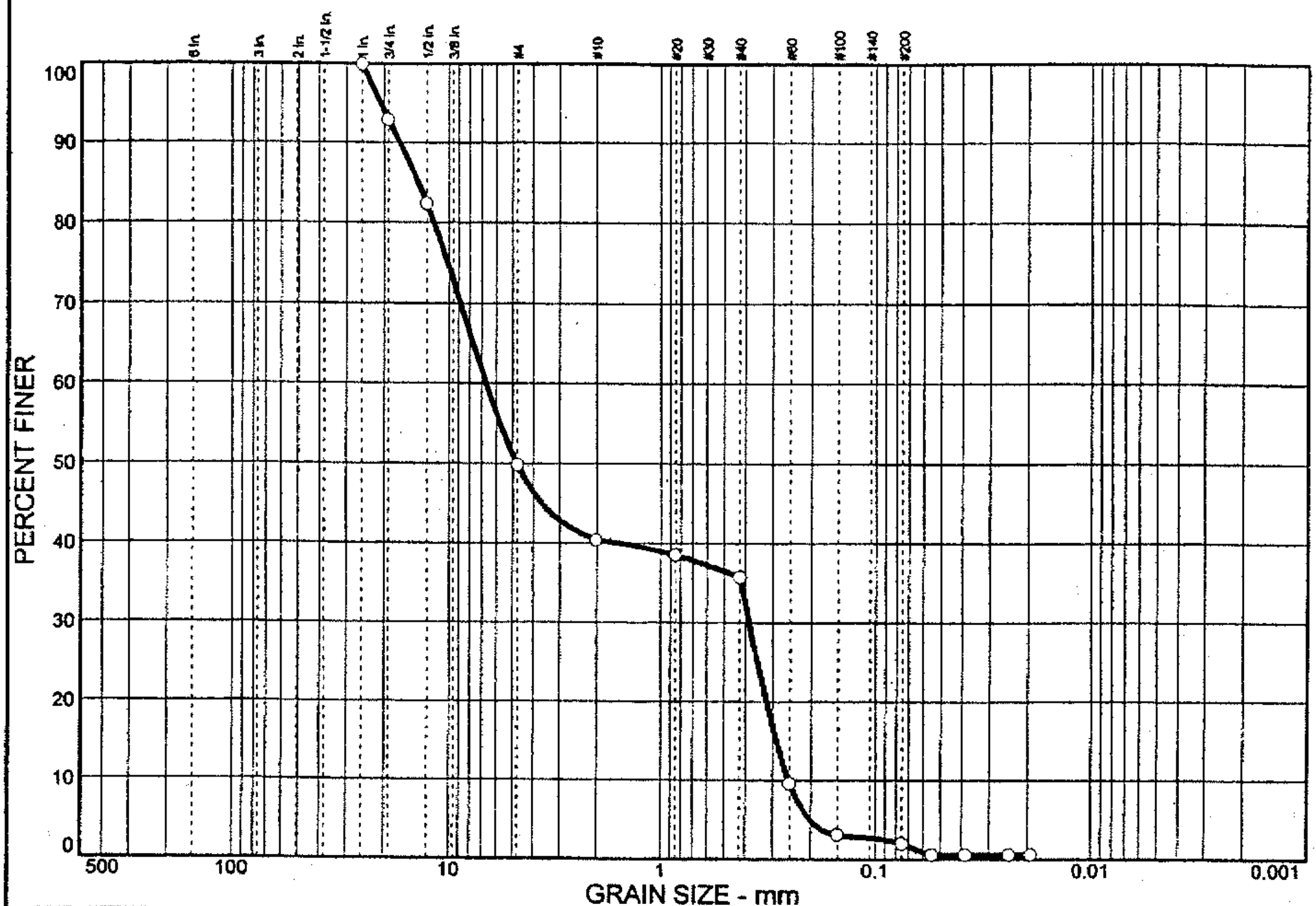
Natural Moisture 23.9%.
Organics Present In Sample.

Sample No.: 2 **Source of Sample:** AP-10 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 15

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	50.2	47.8	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	92.9		
.5 in.	82.4		
#4	49.8		
#10	40.3		
#20	38.5		
#40	35.8		
#60	9.6		
#100	3.1		
#200	2.0		

* (no specification provided)

Soil Description

Poorly graded gravel with sand.
0.6% finer than 0.02mm.
Non Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 13.9 D_{60}= 6.69 D_{50}= 4.79
D_{30}= 0.384 D_{15}= 0.288 D_{10}= 0.253
C_u= 26.43 C_c= 0.09

Classification

USCS= GP AASHTO=

Remarks

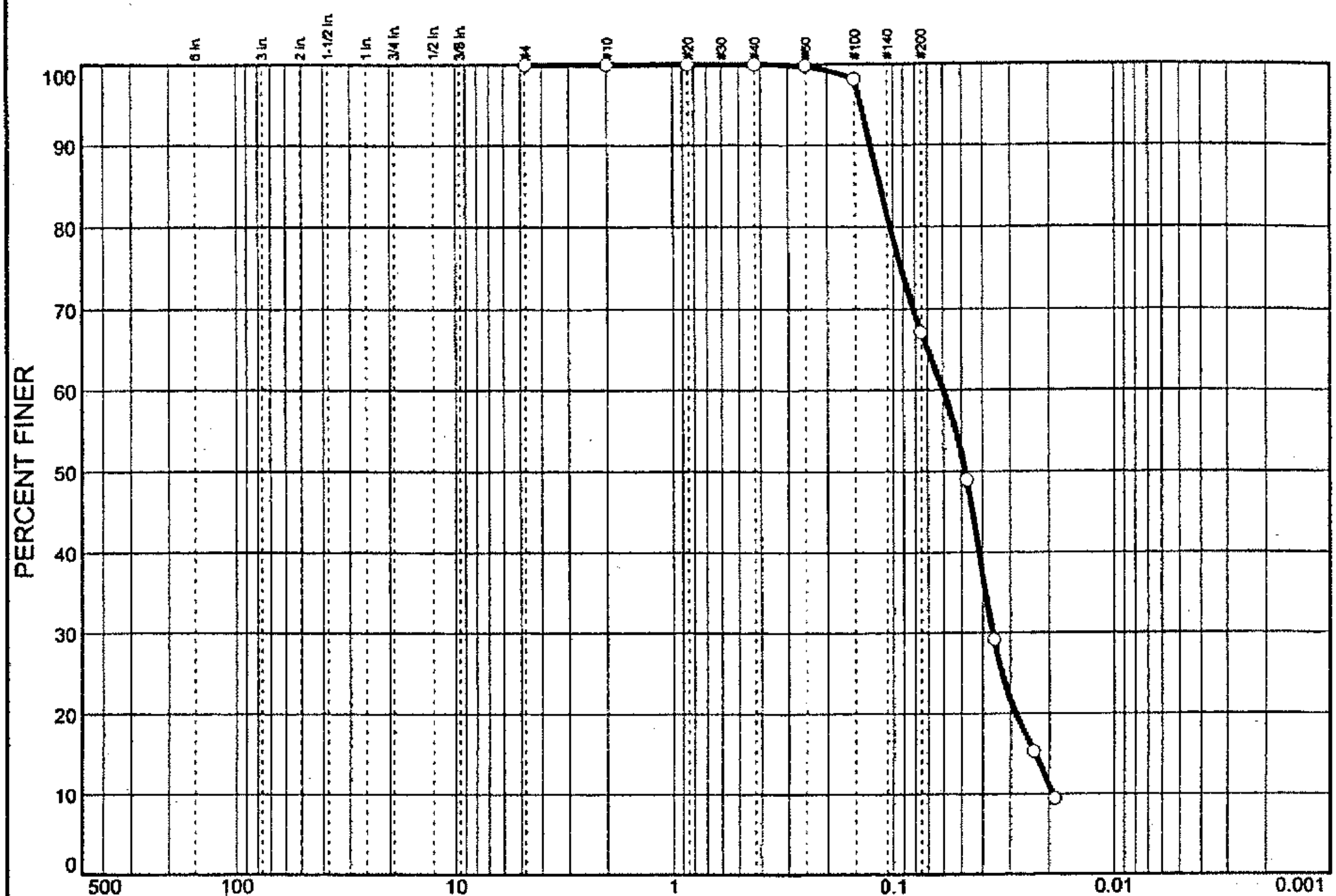
Natural Moisture 1.9%.

Sample No.: 3 **Source of Sample:** AP-10 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 16

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	32.9	67.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.8		
#100	98.2		
#200	67.1		

* (no specification provided)

Soil Description

Sandy silt.
10.9% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.115 D_{60}= 0.0600 D_{50}= 0.0481
D_{30}= 0.0361 D_{15}= 0.0231 D_{10}= 0.0192
C_u= 3.12 C_c= 1.13

Classification

USCS= ML AASHTO=

Remarks

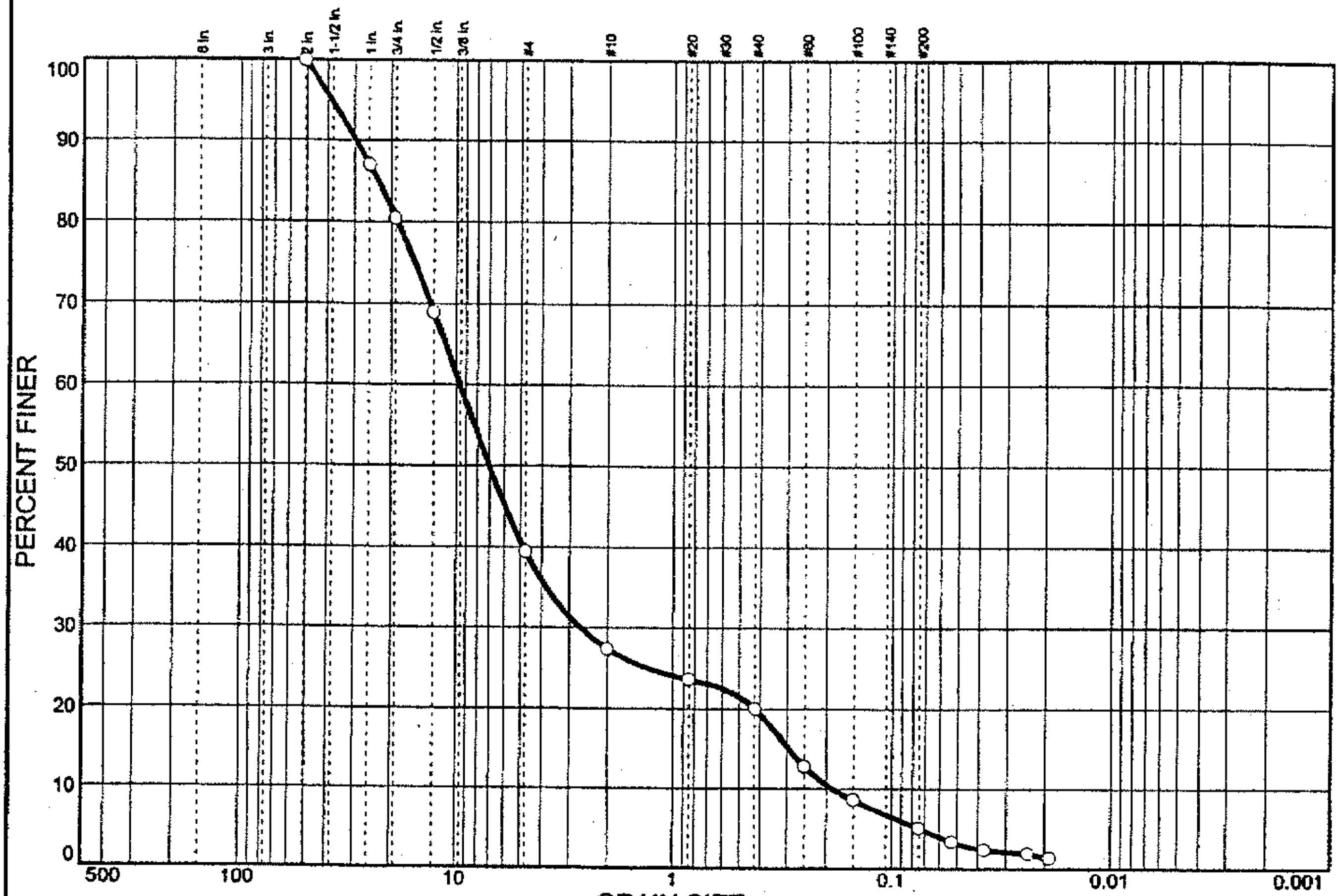
Natural Moisture 14.5%.

Sample No.: 2 **Source of Sample:** AP-11 **Date:** 2/26/01
Location: **Elev./Depth:** 4.0-6.0

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 17

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	60.6	34.3	5.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1 in.	87.0		
.75 in.	80.5		
.5 in.	68.9		
#4	39.4		
#10	27.4		
#20	23.6		
#40	20.0		
#60	12.8		
#100	8.6		
#200	5.1		

* (no specification provided)

Soil Description

Poorly graded gravel with silt and sand.
1.5% finer than 0.02mm.
Non Frost Susceptiible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 23.1 D_{60}= 9.63 D_{50}= 7.02
D_{30}= 2.67 D_{15}= 0.294 D_{10}= 0.186
C_u= 51.66 C_c= 3.98

Classification

USCS= GP-GM AASHTO=

Remarks

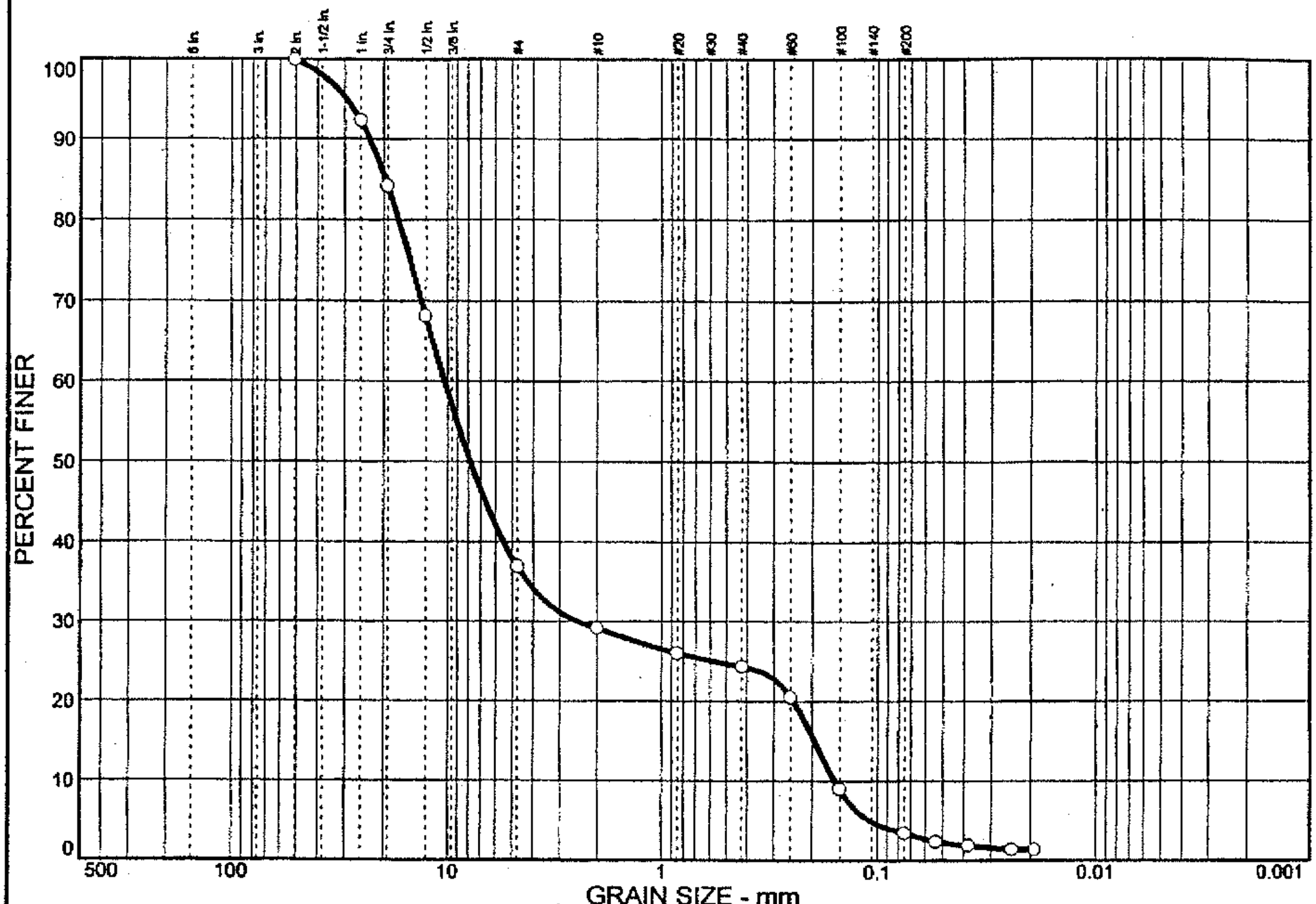
Natural Moisture 1.4%.

Sample No.: 3 **Source of Sample:** AP-11 **Date:** 2/26/01
Location: **Elev./Depth:** 9.0-11.0

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 18

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	63.1	33.4	3.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1 in.	92.3		
.75 in.	84.2		
.5 in.	68.1		
#4	36.9		
#10	29.1		
#20	26.0		
#40	24.3		
#60	20.5		
#100	9.0		
#200	3.5		

* (no specification provided)

Soil Description

Poorly graded gravel with sand.
1.4% finer than 0.02mm.
Non Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 19.5 D_{60}= 10.4 D_{50}= 7.82
D_{30}= 2.46 D_{15}= 0.195 D_{10}= 0.158
C_u= 65.69 C_c= 3.70

Classification

USCS= GP AASHTO=

Remarks

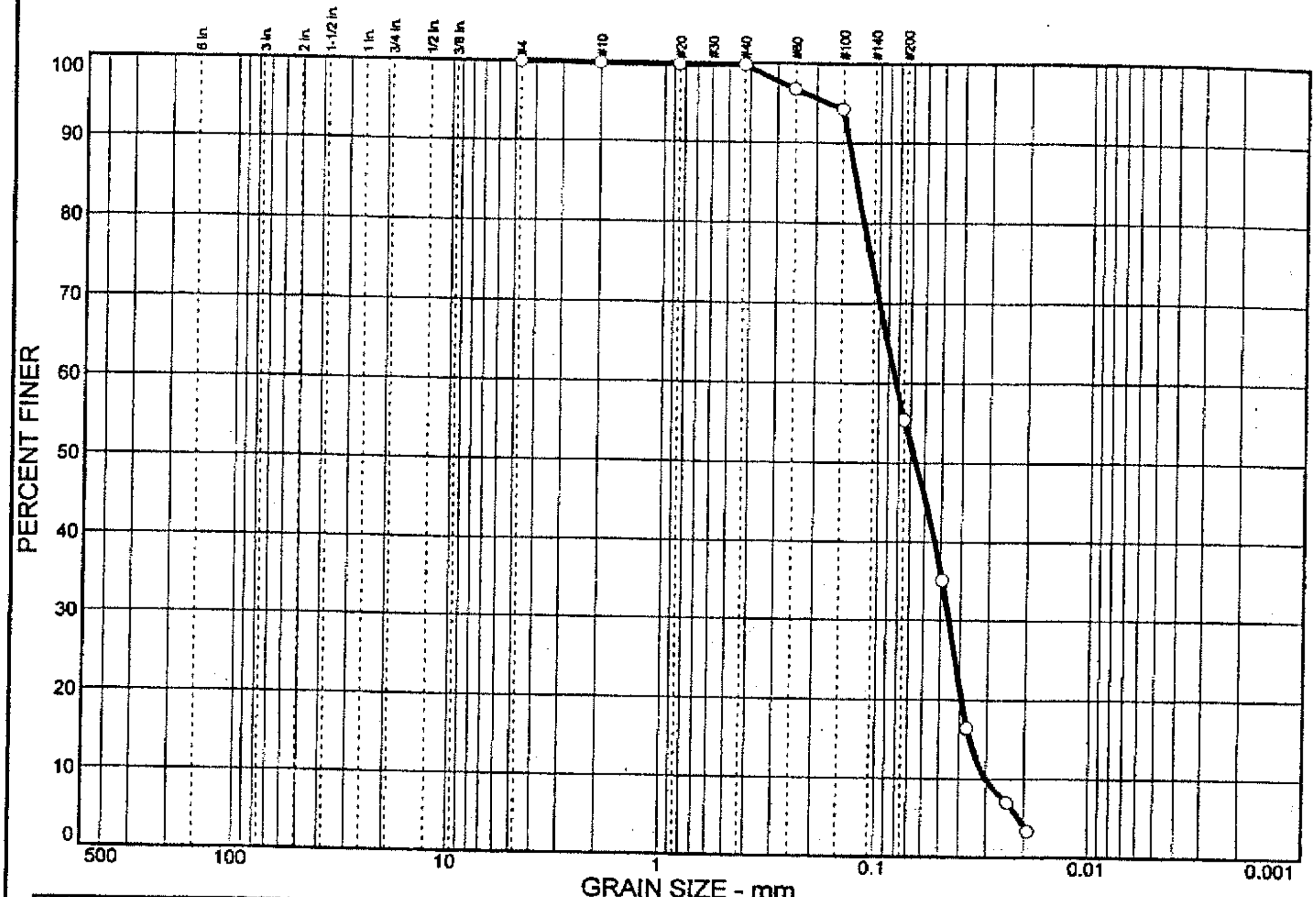
Natural Moisture 7.1%.

Sample No.: 6 **Source of Sample:** AP-11 **Date:** 2/26/01
Location: **Elev./Depth:** 24.0-26.0

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 56

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	44.6	55.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#20	99.8		
#40	99.8		
#60	96.8		
#100	94.3		
#200	55.4		

* (no specification provided)

Soil Description

Sandy silt.
4.0% finer than 0.02mm.
Frost Class F 4.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.129 D_{60}= 0.0826 D_{50}= 0.0662
D_{30}= 0.0455 D_{15}= 0.0358 D_{10}= 0.0302
C_u= 2.73 C_c= 0.83

Classification

USCS= ML AASHTO=

Remarks

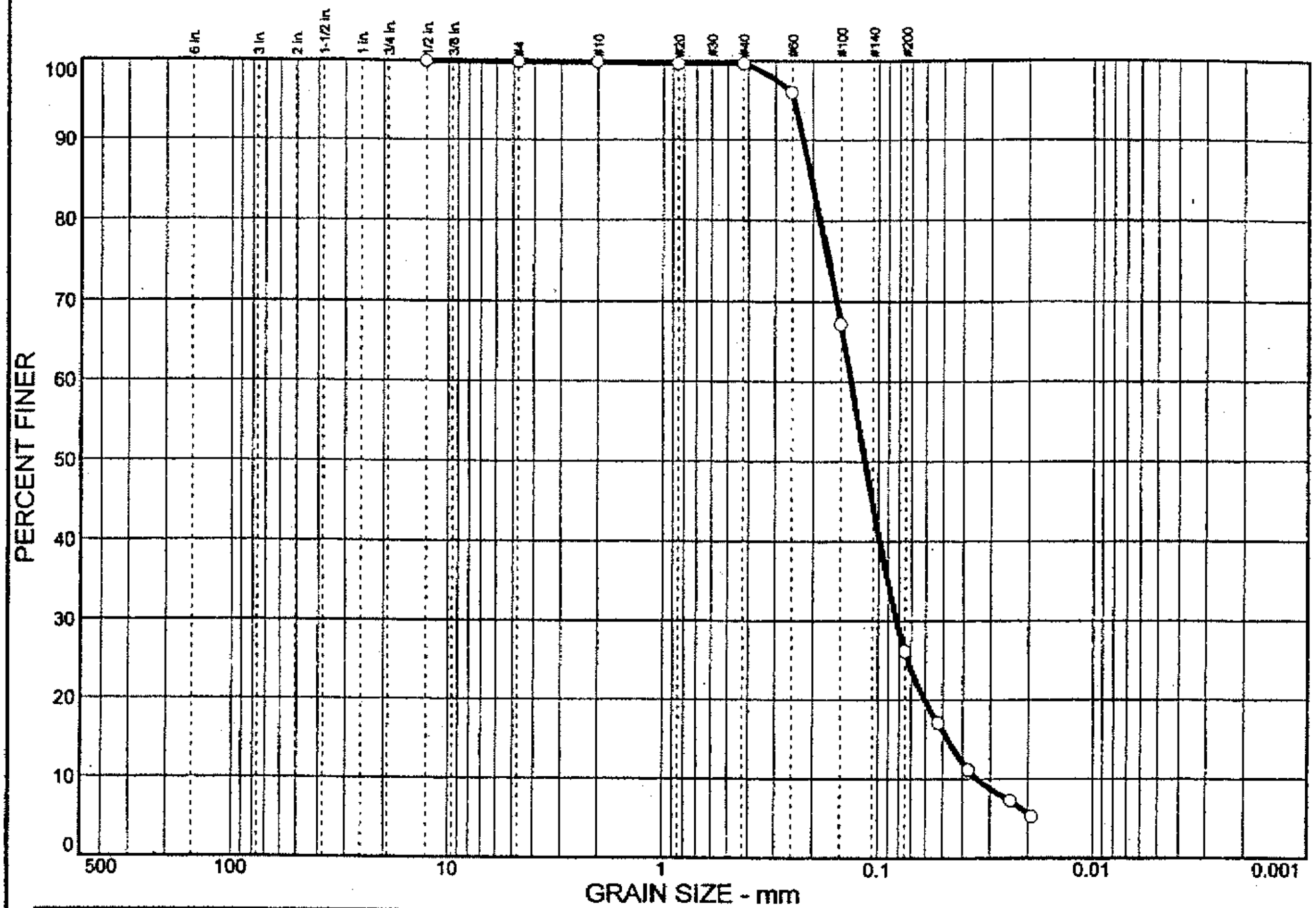
Natural Moisture 10.8%.

Sample No.: 3a **Source of Sample:** AP-12 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 19

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.1	73.8	26.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
#4	99.9		
#10	99.9		
#20	99.7		
#40	99.7		
#60	96.1		
#100	67.2		
#200	26.1		

* (no specification provided)

Soil Description

Silty sand.
5.5% finer than 0.02mm.
Frost Class S 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.203 D_{60}= 0.134 D_{50}= 0.116
D_{30}= 0.0822 D_{15}= 0.0471 D_{10}= 0.0345
C_u= 3.90 C_c= 1.46

Classification

USCS= SM AASHTO=

Remarks

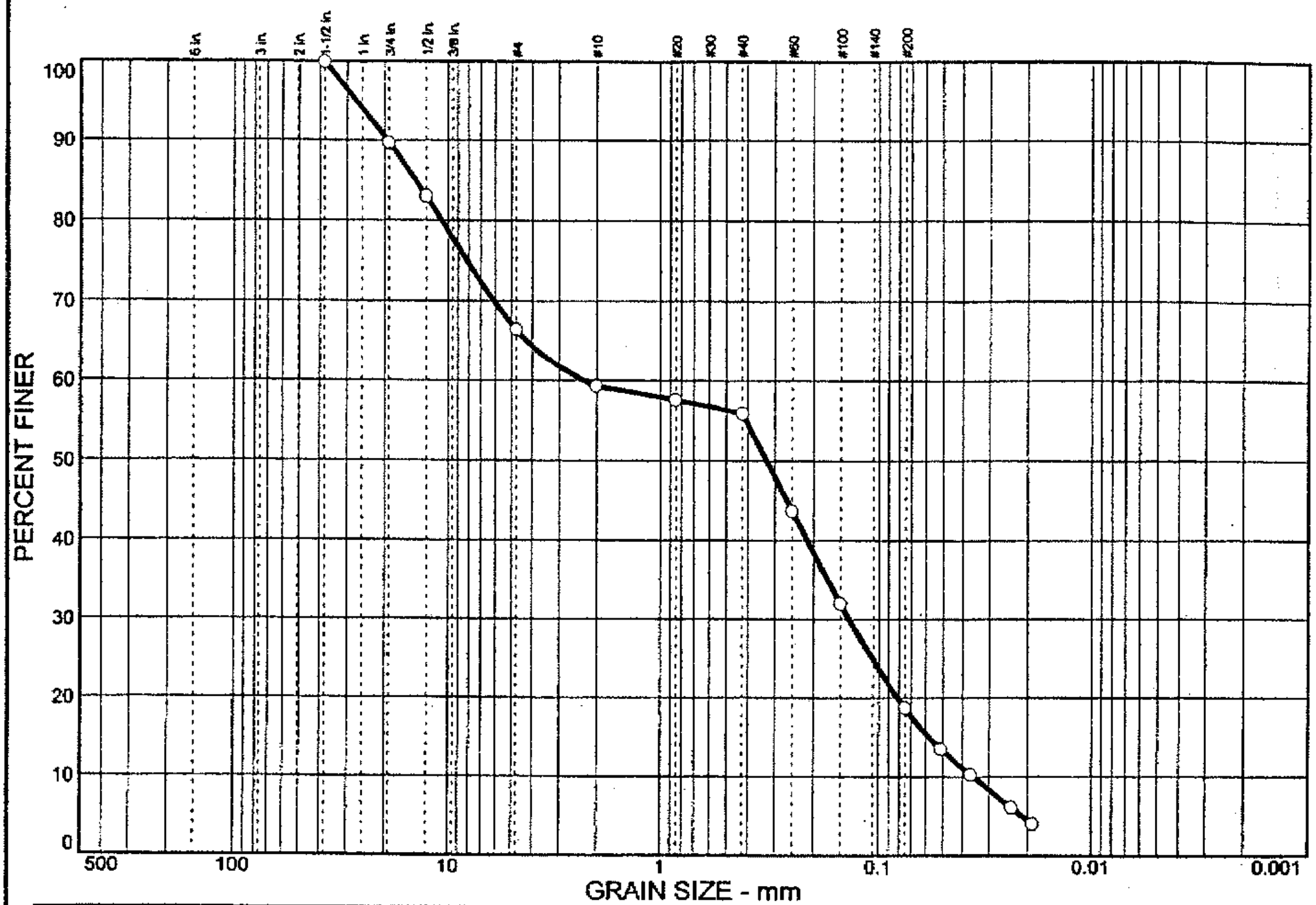
Natural Moisture 33.3%.
Sticks Present In Sample.

Sample No.: 4 **Source of Sample:** AP-12 **Date:** 2/26/01
Location: **Elev./Depth:** 14.5-16.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 58

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	33.6	47.7	18.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
.75 in.	89.7		
.5 in.	83.0		
#4	66.4		
#10	59.3		
#20	57.6		
#40	55.9		
#60	43.7		
#100	32.0		
#200	18.7		

* (no specification provided)

Soil Description

Silty sand with gravel.
4.5% finer than 0.02mm.
Frost Class S 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 14.3 D_{60}= 2.29 D_{50}= 0.328
D_{30}= 0.137 D_{15}= 0.0578 D_{10}= 0.0355
C_u= 64.57 C_c= 0.23

Classification

USCS= SM AASHTO=

Remarks

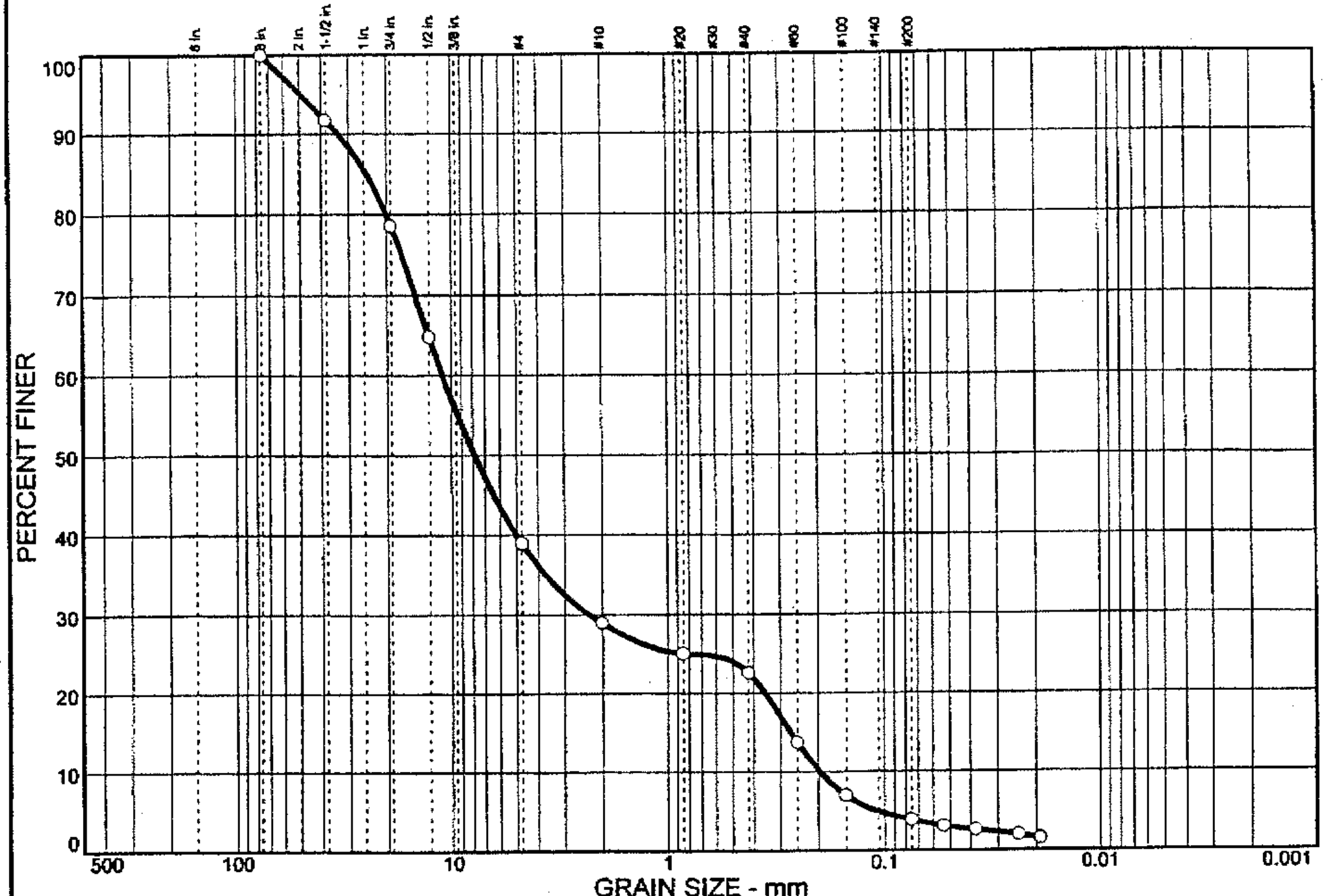
Natural Moisture 20.1%.
Organics Present In Sample.

Sample No.: 3 **Source of Sample:** AP-13 **Date:** 2/26/01
Location: **Elev./Depth:** 9.5-11.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 20

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	61.1	35.0	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
1.5 in.	91.8		
.75 in.	78.6		
.5 in.	64.8		
#4	38.9		
#10	28.9		
#20	25.0		
#40	22.6		
#60	13.7		
#100	7.0		
#200	3.9		

* (no specification provided)

Soil Description

Well-graded gravel with sand.
1.6% finer than 0.02mm.
Possibly Frost Susceptible.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 24.7 D_{60}= 11.0 D_{50}= 7.84
D_{30}= 2.30 D_{15}= 0.269 D_{10}= 0.197
C_u= 55.95 C_c= 2.45

Classification

USCS= GW AASHTO=

Remarks

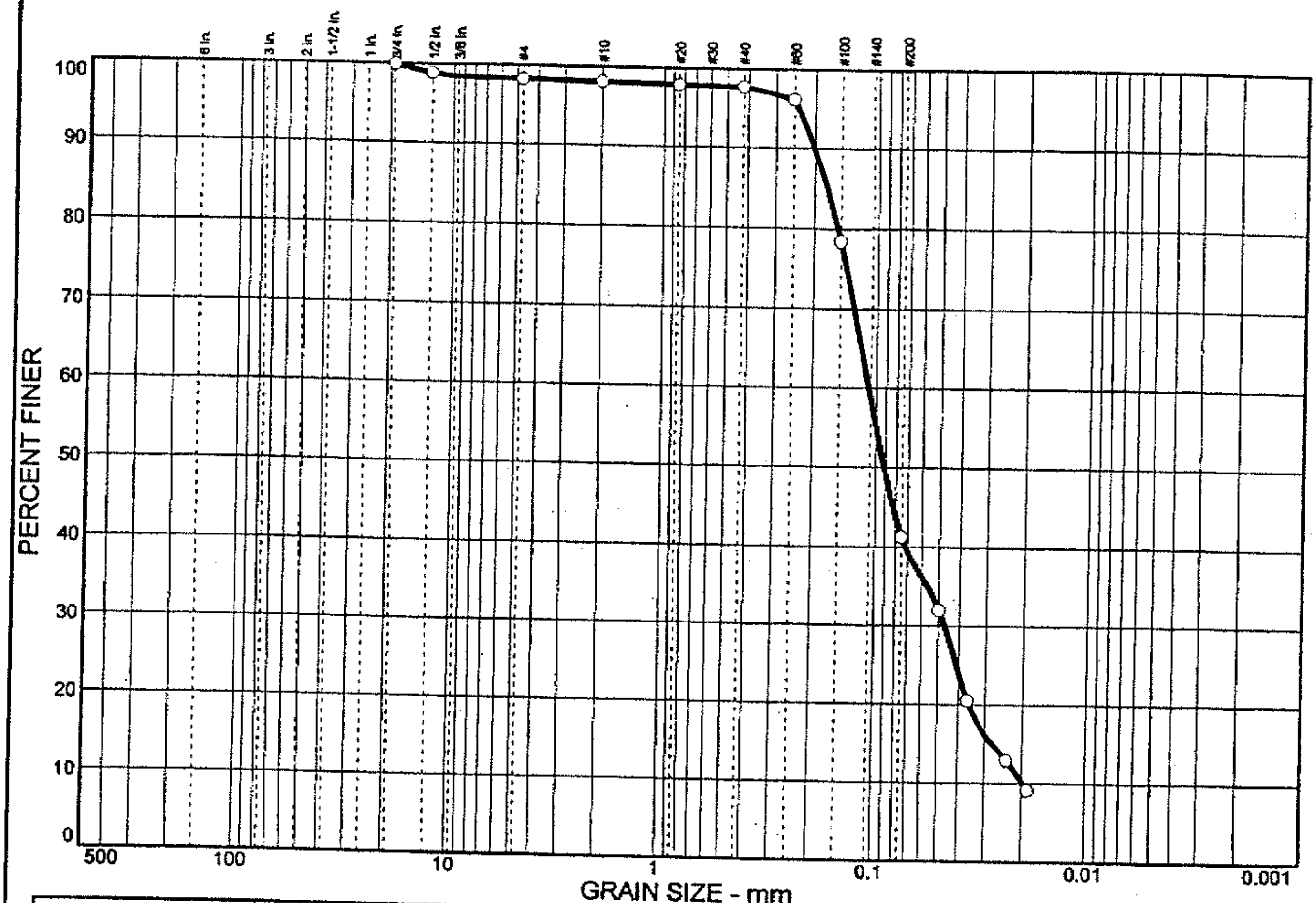
Natural Moisture 6.6%.

Sample No.: 5 **Source of Sample:** AP-13 **Date:** 2/26/01
Location: **Elev./Depth:** 19.5-21.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 55

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.7	57.0	41.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.9		
#4	98.3		
#10	98.1		
#20	97.9		
#40	97.7		
#60	96.2		
#100	78.4		
#200	41.3		

* (no specification provided)

Soil Description

Silty sand.
10.1% finer than 0.02mm.
Frost Class F 2.

Atterberg Limits

PL= NP LL= NV PI=

Coefficients

D_{85}= 0.174 D_{60}= 0.109 D_{50}= 0.0915
D_{30}= 0.0468 D_{15}= 0.0277 D_{10}= 0.0198
C_u= 5.51 C_c= 1.02

Classification

USCS= SM AASHTO=

Remarks

Natural Moisture 11.3%.

Sample No.: 2 **Source of Sample:** AP-14 **Date:** 2/26/01
Location: **Elev./Depth:** 4.5-6.5

A.W. Murfitt Company

Client: U.S. Army Engineer District, Alaska
Project: Family Housing Upgrade (FTW230)
Fort Wainwright, Alaska
Project No: 01-369.08 **Plate** 21